

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 12
Edition : 08.06.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 403 446 246A
Injection pump
Pump designation : PES6MW100/720RS1144
EP type number : 0 413 406 138
Governor
Governor design. : RQV300...1300MW50-6
Governor no. : 0 420 083 209

Customer-spec. information
Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 047
Inlet press., bar : 1.50
Test nozzle holder
assembly : 0 681 343 009
Opening
pressure, bar : 172...175
Test lines : 1 680 750 015
Outside diameter
x Wall thickness
x Length mm : 6.00X1.50X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

A01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
Rack travel in mm : 11.00...11.10
Del.quantity cm3/ : 7.7...7.9
100 s : (7.5...8.1)
Spread cm3 : 0.3
100 s : (0.6)
2nd speed rpm : 300.0
Rack travel in mm : 8.0...8.2
Del.quantity cm3/ : 0.9...1.3
100 s : (0.6...1.5)
Spread cm3 : 0.3
100 s : (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1430
travel mm : 9.30...9.70
2nd speed rpm : 1340
travel mm : 8.50...8.70
3rd speed rpm : 500
travel mm : 2.70...3.30
4th speed rpm : 300
travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1300
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1300
Aneroid pressure h: 800
Del.quantity : 77.0...79.0
1000 : (75.0...81.0)
Spread cm3 : 3.50
1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.20  
Speed rpm : 300  
Rack travel in mm : 8.00...8.20

TORQUE CONTROL  
Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 585  
Rack travel in m: 12.00...12.20  
4th speed rpm : 1100  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Pressure hPa : -  
Rack travel mm : 8.50...8.60

1st pressure hPa : 180  
Rack travel in m: 9.00...9.10  
2nd pressure hPa : 450  
Rack travel in m: 11.10...11.40  
3rd pressure hPa : 800  
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 800  
Del.quantity cm3/ : 76.0...78.0  
1000 s: (74.0...80.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 800  
Speed rpm : 585  
Del.quantity cm3/ : 68.5...71.5  
1000 s: (66.0...74.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 20.0...22.0  
1000 s: (18.0...24.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.00...8.20  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 2,8 T 2  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 253  
 Injection pump  
 Pump designation : PES6MM100/320RS1176  
 EP type number : 0 413 406 158  
 Governor  
 Governor design. : RQV275...1250MW80-6  
 Governor no. : 0 420 083 215

Customer-spec. information  
 Customer : RVI

Engine : MIDR 060226H

1st version kW : 143.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 033  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 008  
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

A03

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm<sup>3</sup>/ : 9.9...10.1  
 100 s: (9.7...10.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 275.0  
 Rack travel in mm : 6.60...6.80  
 Del.quantity cm<sup>3</sup>/ : 2.0...2.4  
 100 s: (1.7...2.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 8.90...9.30  
 2nd speed rpm : 1325  
 travel mm : 8.00...8.20  
 3rd speed rpm : 500  
 travel mm : 3.00...3.60  
 4th speed rpm : 275  
 travel mm : 1.00...1.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1320  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 750  
 Del.quantity : 99.0...101.0  
 1000 : (97.0...103.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 10.40  
Speed rpm : 1335...1345  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 6.7

Testing:

Speed rpm : 200  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 6.60...6.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 750  
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.60...9.70  
2nd pressure hPa : 150  
Rack travel in m: 9.90...10.00  
3rd pressure hPa : 300  
Rack travel in m: 10.90...11.20

START CUT-OUT

Speed 1/min : 200 (220)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750  
Speed rpm : 750  
Del.quantity cm3/ : 94.5...97.5  
1000 s: (92.0...100.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

A04

Speed rpm : 500  
Del.quantity cm3/ : 51.0...53.0  
1000 s: (49.0...55.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1335...1345

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...102.0  
1000 s: (85.0...105.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 6.60...6.80  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Set start-of-delivery sensor at pre-stroke to 3.50...3.60 mm for cylinder 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6, D D 89  
 Edition : 01.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 257  
 Injection pump  
 Pump designation : PES6MM100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-7  
 Governor no. : 0 420 083 221

Customer spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

A05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 7.8...7.9

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.70

2nd speed rpm : 1450

travel mm : 9.50...9.90

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 7.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.30  
Speed rpm : 300  
Rack travel in mm : 7.80...7.90

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 800  
Rack travel in m: 11.60...11.80  
3rd speed rpm : 585  
Rack travel in m: 11.80...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.50...8.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 500  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 900  
Rack travel in m: 11.80...12.00

START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 71.0...73.0  
1000 s: (69.0...75.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 900  
Speed rpm : 585  
Del.quantity cm<sup>3</sup>/ : 65.0...68.0  
1000 s: (62.5...70.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 20.0...22.0  
1000 s: (18.0...24.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 7.80...7.90  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 58  
 Edition : 29.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 258  
 Injection pump  
 Pump designation : PES6MW100/720RS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RQV300...1300MW50-8  
 Governor no. : 0 420 083 222

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 149.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 345 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

A07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s : (9.9...10.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 5.5...5.6  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.1  
 100 s : (0.6...1.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1340  
 travel mm : 8.60...8.80  
 2nd speed rpm : 1430  
 travel mm : 9.30...9.70  
 3rd speed rpm : 300  
 travel mm : 1.20...1.60  
 4th speed rpm : 700  
 travel mm : 3.80...4.40

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 700  
 Del.quantity : 101.0...103.0  
 1000 : (99.0...105.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1440...1470  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.60

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

CONSTANT REGULATION  
Speed rpm : 320...530

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 300  
Rack travel mm : 8.30...8.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.40...7.50  
2nd pressure hPa : 450  
Rack travel in m: 10.10...10.30  
3rd pressure hPa : 700  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (230)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700

A08

Speed rpm : 600  
Del.quantity cm3/ : 85.5...88.5  
1000 s: (83.0...91.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 27.0...29.0  
1000 s: (25.0...31.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.60  
Del.quantity cm3/ : 9.0...11.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 65  
 Edition : 29.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 259  
 Injection pump  
 Pump designation : PES6MW100/72ORS1131-1  
 EP type number : 0 413 406 165  
 Governor  
 Governor design. : RQV300...1300MW68-2  
 Governor no. : 0 420 083 224

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 177.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 14.40...14.50  
 Del.quantity cm<sup>3</sup>/ : 11.4...11.6  
 100 s: (11.2...11.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.30...9.70  
 2nd speed rpm : 1350  
 travel mm : 8.40...8.60  
 3rd speed rpm : 600  
 travel mm : 3.90...4.50  
 4th speed rpm : 300  
 travel mm : 0.80...1.20

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1350  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 1000  
 Del.quantity : 114.0...116.0  
 1000 : (112.0...118.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 11.50...11.70  
2nd pressure hPa : 400  
Rack travel in m: 13.00...13.20  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 106.5...109.5  
1000 s: (104.0...112.0)  
Spread cm3 : 5.00  
1000 s: (7.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 35  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 260  
 Injection pump  
 Pump designation : PES6MM100/720RS1120  
 EP type number : 0 413 406 112  
 Governor  
 Governor design. : RQV300...1300MW50-9  
 Governor no. : 0 420 083 223

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366LA

1st version kW : 149.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar : 30...32  
 Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300  
 Rack travel in mm : 13.90...14.00  
 Del. quantity cm<sup>3</sup>/ : 10.8...11.0  
 100 s : (10.6...11.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.7...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450  
 travel mm : 9.40...10.00  
 2nd speed rpm : 1350  
 travel mm : 8.50...8.70  
 3rd speed rpm : 450  
 travel mm : 2.40...3.00  
 4th speed rpm : 300  
 travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1340  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1300  
 Aneroid pressure h : 1000  
 Del. quantity : 108.0...110.0  
 1000 : (106.0...112.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 111...119

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1530  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 320...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.10...8.10

Measurement  
Speed 1/min : 500

1st pressure hPa : 280  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 600  
Rack travel in m: 12.50...12.70  
3rd pressure hPa : 1000  
Rack travel in m: 13.90...14.00

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

Spread cm<sup>3</sup> : 3.50  
1000 s: (6.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 21.0...23.0  
1000 s: (19.0...25.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...100.0  
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,2 W  
 Edition : 06.07.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 109  
 Injection pump  
 Pump designation : PES6MW100/321RS1200  
 EP type number : 0 413 406 189  
 Governor  
 Governor design. : RQV250...1200MW83-2  
 Governor no. : 0 420 083 216

Cust. part no. : 3-7036

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 10.50...10.60

2nd speed rpm : 810

travel mm : 5.90...6.10

3rd speed rpm : 500

travel mm : 3.70...4.30

4th speed rpm : 250

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1225

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 120...128

Testing:

1st rack travel in: 11.50  
Speed rpm : 1245...1260

2nd rack travel in: 4.00  
Speed rpm : 1300...1330

4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 330...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 170 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 135.0...138.0  
1000 s: (132.5...140.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 138.0...141.0  
1000 s: (135.5...143.5)

Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 136.0...139.0  
1000 s: (133.5...141.5)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: MAN # 3-7036  
Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAN 7,2 V  
 Edition : 06.07.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 403 456 110

Injection pump  
 Pump designation : PES6MW100/321RS1201  
 EP type number : 0 413 406 190  
 Governor  
 Governor design. : RQ250/1200MW84-3  
 Governor no. : 0 420 082 043

Cust. part no. : 3-7047

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LFO2

1st version kW : 165.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 15.00...0.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 13.7...13.9

100 s: (13.5...14.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1300

travel mm : 8.40...8.80

2nd speed rpm : 1260

travel mm : 6.60...6.80

3rd speed rpm : 345

travel mm : 4.00...4.60

4th speed rpm : 250

travel mm : 1.80...2.20

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 1000

Rack travel in mm : 18.20...19.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 137.0...139.0

1000 : (135.0...141.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 92...100

Setting point:  
Speed rpm : 1000  
Rack travel in mm : 19.0

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 800  
Rack travel in m: 12.50...12.80  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 170  
Rack travel mm : 10.20...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10

2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 180 (200)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 135.0...138.0  
1000 s: (132.5...140.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 138.0...141.0  
1000 s: (135.5...143.5)  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 134.5...137.5  
1000 s: (132.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

: MAN # 3-7047  
Start-of-delivery mark = 13,5° after  
start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a  
 Edition : 03.07.90  
 Replaces : 10.86  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 449  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1100A2C2209  
 R  
 Governor no. : 9 420 083 201

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3 L

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...7.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 10.30...10.40  
 Del. quantity cm<sup>3</sup>/ : 9.0...9.2  
 100 s: (8.8...9.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.7...5.9  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.4...2.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del. quantity : 90.0...92.0  
 1000 : (88.0...94.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 85...93

Testing:

1st rack travel in: 9.30  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 495...555

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.50  
5th speed rpm : 400  
Rack travel in m: 10.70...11.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...77.0  
1000 s: (71.5...79.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...149.0  
1000 s: (132.0...152.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90

Del.quantity cm<sup>3</sup>/ : 16.5...20.5  
1000 s: (14.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start of delivery - engine 11° before  
TDC



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 5,7 o 4  
 Edition : 03.07.90  
 Replaces : 1.86  
 Test oil : ISO-4113

Combination no. : 9 400 085 254

Injection pump  
 Pump designation : PES6A90D410RS2293  
 EP type number : 0 410 896 031  
 Governor  
 Governor design. : RSV500...900A0B2211-  
 1L  
 Governor no. : 9 420 083 204

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 352 (A)

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 880

Rack travel in mm : 10.00...10.10

Del. quantity cm<sup>3</sup>/ : 5.7...5.8  
 100 s : (5.5...6.0)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

2nd speed rpm : 500.0  
 Rack travel in mm : 6.4...6.6  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.4  
 100 s : (0.8...1.6)

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 880  
 Del. quantity : 57.0...58.0  
 1000 : (55.0...60.0)

Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 83...91

Testing:  
 1st rack travel in: 9.00  
 Speed rpm : 905...910

2nd rack travel in: 4.00  
 Speed rpm : 950...955

4th rack travel in: 1100  
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 6.00

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 535...595

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 880  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 500  
Rack travel in m: 10.00...10.20  
4th speed rpm : 400  
Rack travel in m: 11.40...11.60

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.00  
Speed rpm : 905...910

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 14.20...14.80

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (8.0...16.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 3,9 d 1  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 313  
 Injection pump  
 Pump designation : PES4A90D32ORS2744  
 EP type number : 9 400 084 012  
 Governor  
 Governor design. : RSV350...1150A2B2129  
 -8R  
 Governor no. : 9 420 083 241

Customer-spec. information  
 Customer : MWM

Engine : TD 229 EC-4

1st version kW : 73.6  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.50...10.60

Del. quantity cm<sup>3</sup>/ : 8.6...8.7

100 s: (8.4...8.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del. quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 86.5...87.5

1000 : (84.5...89.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control Lever  
position degrees: 99...107

Testing:

1st rack travel in: 9.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Rack travel in mm : 2.00  
Speed rpm : 555...615

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 500  
Rack travel in m: 10.80...10.90  
3rd speed rpm : 800  
Rack travel in m: 10.80...10.90  
4th speed rpm : 960  
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm3/ : 80.5...82.5  
1000 s: (78.0...85.0)  
Speed rpm : 800  
Del.quantity cm3/ : 85.0...87.0  
1000 s: (82.5...89.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 2.50  
1000 s: (4.50)

Remarks:

: VALMET

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MMM 5,9 L  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 314  
 Injection pump  
 Pump designation : PES6A90D32ORS2718  
 EP type number : 9 400 084 003  
 Governor  
 Governor design. : RSV350...1150A2B2097  
 -2R  
 Governor no. : 9 420 083 224

Customer-spec. information  
 Customer : MMM

Engine : TD 229 EC-06

1st version kW : 117.8  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 046

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.30...11.40

Del. quantity cm<sup>3</sup>/ : 8.6...8.7

100 s: (8.4...8.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del. quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (1.0...1.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 86.5...87.5

1000 : (84.5...89.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control Lever  
position degrees: 95...103

Testing:  
1st rack travel in: 10.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1255...1285  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control Lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 575...635

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.30...11.40  
2nd speed rpm : 500  
Rack travel in m: 11.90...12.10  
4th speed rpm : 800  
Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 84.5...86.5  
1000 s: (82.0...89.0)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 86.0...88.0  
1000 s: (83.5...90.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 12.5...16.5  
1000 s: (10.5...18.5)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks: : VALMET

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 g 4  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 317  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1300AB1066-6L  
 Governor no. : 9 420 080 265

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 A

1st version kW : 125.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 11

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 105...113

Testing:

1st rack travel in: 9.40

Speed rpm : 1340...1350

2nd rack travel in: 4.00

Speed rpm : 1460...1490

4th rack travel in: 1630

Speed rpm : 0.00...1.00

LOW IDLE ↑

Control Lever

position degrees: 62...70

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 10.40...10.50

2nd speed rpm : 800

Rack travel in m: 10.90...11.00

4th speed rpm : 1000

Rack travel in m: 10.60...10.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.90...11.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.50...9.70

2nd pressure hPa : 450

Rack travel in m: 10.50...10.60

3rd pressure hPa : 300

Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

A27

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm3/ : 86.0...89.0

1000 s: (83.5...91.5)

Speed rpm : 1000

Del.quantity cm3/ : 88.0...91.0

1000 s: (85.5...93.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 59.0...61.0

1000 s: (57.0...63.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 95.0...115.0

1000 s: (-)

Rack travel in mm : 14.50...14.70

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,8 c  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 319  
 Injection pump  
 Pump designation : PES6A95D410RS2772  
 EP type number : 9 400 084 018  
 Governor  
 Governor design. : RQV300...1400AB1066-  
 10L  
 Governor no. : 9 420 080 287

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 352 A

1st version kW : 141.0  
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 006

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1400

Rack travel in mm : 9.50...9.60

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.80...1.30

2nd speed rpm : 500

travel mm : 2.30...2.80

3rd speed rpm : 750

travel mm : 4.10...4.30

4th speed rpm : 1500

travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

Aneroid pressure h: 700

Del.quantity : 77.5...79.5

1000 : (75.5...81.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 8.50

Speed rpm : 1440...1450

2nd rack travel in: 4.00

Speed rpm : 1520...1550

4th rack travel in: 1650

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

Speed rpm : 100

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

Speed rpm : 420...550

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1400

Rack travel in m: 9.50...9.60

2nd speed rpm : 800

Rack travel in m: 10.00...10.10

4th speed rpm : 1000

Rack travel in m: 9.70...9.90

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.20...8.50

2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

3rd pressure hPa : 170

Rack travel in m: 9.00...9.20

START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 74.0...77.0

1000 s: (71.5...79.5)

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm<sup>3</sup>/ : 77.5...80.5

1000 s: (75.0...83.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 41.0...43.0

1000 s: (39.0...45.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.50

Speed rpm : 1440...1450

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 70.0...90.0

1000 s: (67.0...93.0)

Rack travel in mm : 12.90...13.10

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 h  
 Edition : 03.07.90  
 Replaces : 24.11.89  
 Test oil : ISO-4113

Combination no. : 9 400 087 416

Injection pump  
 Pump designation : PES6P110A72ORS3226  
 EP type number : 9 400 087 066  
 Governor  
 Governor design. : RQV350...1000PA863-8  
 Governor no. : 9 420 080 271

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 7,8 L TC

1st version kW : 160.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 9 401 087 403

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 017

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test Lines : 1 468 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.55...4.65  
 : (4.50...4.70)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 12.70...12.80

---

Del.quantity cm<sup>3</sup>/ : 13.8...14.0  
 100 s: (13.6...14.2)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.9...7.1  
 Del.quantity cm<sup>3</sup>/ : 2.7...3.1  
 100 s: (2.5...3.4)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200  
 travel mm : 9.30...9.70  
 2nd speed rpm : 1000  
 travel mm : 6.90...7.10  
 3rd speed rpm : 500  
 travel mm : 2.20...3.00  
 4th speed rpm : 350  
 travel mm : 1.40...1.70  
 5th speed rpm : 250  
 travel mm : 0.50...1.10

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1220  
 Rack travel in mm : 7.00...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 900

Del.quantity : 138.0...140.0  
1000 : (136.0...142.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 105...113

#### Testing:

1st rack travel in: 11.70  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 74...82

#### Testing:

Speed rpm : 100  
Minimum rack travel: 12.00  
Speed rpm : 350  
Rack travel in mm : 6.90...7.10

#### CONSTANT REGULATION

Speed rpm : 390...460

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 14.00...14.10  
3rd speed rpm : 850  
Rack travel in m: 13.30...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.90  
2nd pressure hPa : 405  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 695  
Rack travel in m: 13.00...13.30

#### START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...155.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 84.0...86.0  
1000 s: (82.0...88.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.90...7.10  
Del.quantity cm3/ : 27.5...31.5  
1000 s: (25.0...34.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

Delivery-valve spring pre-tension  
3.0...3.2 mm.

Set shutoff stop 1.5...2.0 mm before  
shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 i 1  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 417  
 Injection pump  
 Pump designation : PES6P120A720RS3234  
 EP type number : 9 400 087 068  
 Governor  
 Governor design. : RQV350...1150PA923K  
 Governor no. : 9 420 080 272

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 141.7  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 072

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 70...80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45  
 : (2.30...2.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 2.6...3.2

100 s: (2.4...3.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.50...9.70

2nd speed rpm : 1000

travel mm : 7.80...8.00

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 450

travel mm : 3.50...3.70

5th speed rpm : 350

travel mm : 2.00...2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del.quantity : 144.5...146.5

1000 : (141.5...149.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1210...1220  
2nd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 390...460

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 750  
Rack travel in m: 11.10...11.30  
3rd speed rpm : 650  
Rack travel in m: 10.60...11.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.40...8.80  
2nd pressure hPa : 290  
Rack travel in m: 9.50...9.60  
3rd pressure hPa : 440  
Rack travel in m: 11.10...11.50

START CUT-OUT

B05

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 151.0...157.0  
1000 s: (148.0...160.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 116.0...120.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1210...1220

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (131.0...179.0)  
Rack travel in mm : 10.70...11.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 26.5...32.5  
1000 s: (24.5...34.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 i  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 419  
 Injection pump  
 Pump designation : PES6P120A720RS3234  
 EP type number : 9 400 087 068  
 Governor  
 Governor design. : RQV350...1150PA923-2  
 K  
 Governor no. : 9 420 080 274

Customer spec. information  
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 156.6  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 072

Inlet press., bar : 1.50

Overflow  
 quantity min. l/h: 85...95

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45  
 : (2.30...2.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.50...12.60

Del. quantity cm<sup>3</sup>/ : 14.6...14.8

100 s: (14.3...15.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del. quantity cm<sup>3</sup>/ : 2.6...3.2

100 s: (2.4...3.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.50...9.70

2nd speed rpm : 1000

travel mm : 7.80...8.00

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 450

travel mm : 3.50...3.70

5th speed rpm : 350

travel mm : 2.00...2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del. quantity : 146.5...148.5

1000 : (143.5...151.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 63...71

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1210...1220  
2nd rack travel in: 4.00  
Speed rpm : 1305...1335  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed rpm : 390...460

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 750  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 650  
Rack travel in m: 11.20...11.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1150  
Pressure hPa : 900  
Rack travel mm : 12.50...12.60

Measurement  
Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 345  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 520  
Rack travel in m: 11.30...11.70

START CUT-OUT

B07

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 160.0...166.0  
1000 s: (157.0...169.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 106.5...110.5  
1000 s: (104.5...112.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 11.50  
Speed rpm : 1210...1220

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (141.0...189.0)  
Rack travel in mm : 11.20...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 26.5...32.5  
1000 s: (24.5...34.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 7,8 i 2  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 087 420

Injection pump  
 Pump designation : PES6P120A72ORS3234  
 EP type number : 9 400 087 068  
 Governor  
 Governor design. : RQV350...1150PA923-3  
 K  
 Governor no. : 9 420 080 275

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 7.8 Ltr

1st version kW : 167.8  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 072

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 70...80

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.35...2.45  
 : (2.30...3.50)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.40...13.50

Del.quantity cm<sup>3</sup>/ : 15.8...16.0

100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 2.6...3.2

100 s: (2.4...3.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.50...9.70

2nd speed rpm : 1000

travel mm : 7.80...8.00

3rd speed rpm : 800

travel mm : 6.40...6.80

4th speed rpm : 450

travel mm : 3.50...3.70

5th speed rpm : 350

travel mm : 2.00...2.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 900

Del.quantity : 158.5...160.5

1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 12.40  
Speed rpm : 1210...1220  
2nd rack travel in: 4.00  
Speed rpm : 1335...1365  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 10...18

#### Testing:

Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

#### CONSTANT REGULATION

Speed rpm : 390...460

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 750  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 650  
Rack travel in m: 11.40...11.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1150  
Pressure hPa : 900  
Rack travel mm : 13.40...13.50

#### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 320  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 525  
Rack travel in m: 11.90...12.30

#### START CUT-OUT

B09

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 161.5...167.5  
1000 s: (158.5...170.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 108.5...112.5  
1000 s: (106.5...114.5)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1210...1220

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (138.0...182.0)  
Rack travel in mm : 11.10...11.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 26.5...32.5  
1000 s: (24.5...34.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

#### Remarks:

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FOR 6,6 n  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 087 421

Injection pump  
 Pump designation : PES6P100A72ORS3235  
 EP type number : 9 400 087 067  
 Governor  
 Governor design. : RQV350...1300PA923-4  
 K  
 Governor no. : 9 420 080 276

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 6.6 Ltr

1st version kw : 125.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 072

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 85...95

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.45...3.55  
 : (3.40...3.60)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.90...15.00

Del.quantity cm<sup>3</sup>/ : 14.4...14.6

100 s: (14.1...14.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.2...2.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.8)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.20...9.40

2nd speed rpm : 600

travel mm : 4.80...5.10

3rd speed rpm : 450

travel mm : 3.60...3.90

4th speed rpm : 350

travel mm : 2.00...2.20

5th speed rpm : 275

travel mm : 0.70...1.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1200

Del.quantity : 144.0...146.0

1000 : (141.0...149.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 14.00  
Speed rpm : 1360...1370  
2nd rack travel in: 4.00  
Speed rpm : 1500...1530  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...21

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.50  
Speed rpm : 350  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 390...460

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 14.90...15.00  
2nd speed rpm : 850  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 550  
Rack travel in m: 11.50...11.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1300  
Pressure hPa : 1200  
Rack travel mm : 14.90...15.00

Measurement  
Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 375  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 715  
Rack travel in m: 13.50...13.90

START CUT-OUT

Speed 1/min : 290 (310)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 132.0...138.0  
1000 s: (129.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 86.0...90.0  
1000 s: (84.0...92.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.00  
Speed rpm : 1360...1370

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (138.0...182.0)  
Rack travel in mm : 13.10...13.90

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 14.0...20.0  
1000 s: (12.0...22.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (8.00)

Remarks:

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FOR 7,8 j  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 426  
 Injection pump  
 Pump designation : PES6P110A72ORS3259  
 EP type number : 9 400 087 069  
 Governor  
 Governor design. : RSV650...1250P8A530-  
 2  
 Governor no. : 9 420 082 327

Customer-spec. information  
 Customer : FORD (FNH)

Engine : 7.8 l

1st version kW : 190.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 4.25...4.35  
 : (4.20...4.40)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.00...3.00

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 16.2...16.4

100 s: (16.0...16.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 650.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 2.2...2.6

100 s: (2.0...2.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 1000

Del.quantity : 162.0...164.0

1000 : (160.0...166.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 11.10  
Speed rpm : 1260...1270  
2nd rack travel in: 4.00  
Speed rpm : 1295...1315  
3rd rack travel in: 4.00  
Speed rpm : 1310...1330  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

LOW IDLE 1  
Control lever  
position degrees: 73...81  
Setting point w/out bumper spring  
Speed rpm : 650  
Rack travel in mm : 6.1  
Speed rpm : 650  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 690...750

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1200  
Pressure hPa : 1000  
Rack travel mm : 12.10...12.20

Measurement  
Speed 1/min : 1200

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 400  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 600  
Rack travel in m: 11.40...11.70

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 67.5...69.5  
1000 s: (65.5...71.5)

BREAKAWAY

1st version

B13

1mm rack travel less than  
full load rack tr: 11.10  
Speed rpm : 1260...1270

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 650  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 22.5...26.5  
1000 s: (20.0...29.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: :

APPLICATION

Combine-harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 i 1  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 087 429

Injection pump  
 Pump designation : PES6P120A720RS3256  
 EP type number : 9 400 087 071  
 Governor  
 Governor design. : RQV300...1300PA963  
 Governor no. : 9 420 080 283

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 154.5  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.7...15.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.70

2nd speed rpm : 650  
 travel mm : 3.70...4.30

3rd speed rpm : 1060  
 travel mm : 5.60...6.10

4th speed rpm : 1460  
 travel mm : 9.70...10.20

5th speed rpm : 1360  
 travel mm : 8.20...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 1400

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 900  
Del.quantity : 150.0...152.0  
1000 : (147.9...155.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 107...115

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1410...1440

LOW IDLE 1  
Control Lever  
position degrees: 78...86

Testing:  
Speed rpm : 200  
Minimum rack travel: 10.70  
Speed rpm : 300  
Rack travel in mm : 8.80...9.20

CONSTANT REGULATION  
Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 9.80...10.00

Measurement  
Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 10.50...10.70  
2nd pressure hPa : 600  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900

Speed rpm : 700  
Del.quantity cm3/ : 118.0...122.0  
1000 s: (115.0...125.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (43.0...51.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...100.0  
1000 s: (76.0...104.0)

Remarks:

:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MB 6,0 i  
 Edition : 03.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 087 430

Injection pump  
 Pump designation : PES6P120A720RS3256  
 EP type number : 9 400 087 071  
 Governor  
 Governor design. : RQV300...1300PA963-1  
 Governor no. : 9 420 080 284

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366 LA

1st version kW : 169.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow quantity min. 1/h: 100...120

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
 : (4.25...4.45)

Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 13.10...13.20

---

Del.quantity cm<sup>3</sup>/ : 16.5...16.7  
 100 s: (16.2...17.0)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 8.8...9.2  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.10...1.70

2nd speed rpm : 650  
 travel mm : 3.70...4.30

3rd speed rpm : 1060  
 travel mm : 5.60...6.10

4th speed rpm : 1460  
 travel mm : 9.70...10.20

5th speed rpm : 1360  
 travel mm : 8.20...8.80

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -2

Speed rpm : 1400  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 900  
Del.quantity : 165.0...167.0  
1000 : (162.0...170.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

#### Testing:

1st rack travel in: 12.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450

#### LOW IDLE 1

Control lever  
position degrees: 78...86

#### Testing:

Speed rpm : 200  
Minimum rack travel: 10.70  
Speed rpm : 300  
Rack travel in mm : 8.80...9.20

#### CONSTANT REGULATION

Speed rpm : 300...450

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : -  
Rack travel mm : 10.30...10.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 400  
Rack travel in m: 11.00...11.20  
2nd pressure hPa : 600  
Rack travel in m: 12.20...12.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (143.0...153.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 56.0...58.0  
1000 s: (53.0...61.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 80.0...100.0  
1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 b  
 Edition : 26.03.90  
 Replaces : 1.9.88  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 103  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -2  
 EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1100AB1227R  
 Governor no. : 9 420 231 015

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT 8.3  
 1st version kW : 156.6  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 017  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,6  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100  
 Rack travel in mm : 12.60...12.70  
 Del. quantity cm<sup>3</sup>/ : 12.6...12.8  
 100 s: (12.4...13.0)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.4...5.6  
 Del. quantity cm<sup>3</sup>/ : 1.8...2.2  
 100 s: (1.5...2.4)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1100  
 travel mm : 7.70...7.80  
 2nd speed rpm : 1150  
 travel mm : 8.00...8.60  
 3rd speed rpm : 1290  
 travel mm : 9.50...10.10  
 4th speed rpm : 350  
 travel mm : 1.20...1.60  
 5th speed rpm : 600  
 travel mm : 3.90...4.50

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 900

Del. quantity : 126.5...128.5  
1000 : (124.5...130.5)  
Spread cm<sup>3</sup> : 4.00  
1000 : (6.50)

#### RATED SPEED

1st version  
Control Lever  
position degrees: 57...65

#### Testing:

1st rack travel in: 11.60  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 9...17  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.30  
2nd pressure hPa : 405  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 535  
Rack travel in m: 11.80...12.20

#### START CUT-OUT

Speed 1/min : 260 (280)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 79.0...83.0  
1000 s: (77.0...85.0)

#### BREAKAWAY

B19

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (160.0...190.0)  
Rack travel in mm : 15.30...15.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Del. quantity cm<sup>3</sup>/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

Set shutoff solenoid 0.5...1.5 mm  
before shutoff.

Start-of-delivery mark is at 7° after  
start of delivery.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 6, D D 83  
 Edition : 17.05.90  
 Replaces : 16.02.90  
 Test oil : ISO-4113

Combination no. : 0 403 446 246

**Injection pump**  
 Pump designation : PES6MW100/72ORS1144  
 EP type number : 0 413 406 138  
 Governor  
 Governor design. : RQV300...1300MW50-6  
 Governor no. : 0 420 083 209

**Customer-spec. information**  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 125.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm<sup>3</sup>/ : 7.7...7.9  
 100 s : (7.5...8.1)

---

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 8.0...8.2  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s : (0.6...1.5)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 1430  
 travel mm : 9.30...9.70

2nd speed rpm : 1340  
 travel mm : 8.50...8.70

3rd speed rpm : 500  
 travel mm : 2.70...3.30

4th speed rpm : 300  
 travel mm : 1.20...1.60

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1

Speed rpm : 1300  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Aneroid pressure h: 800  
 Del.quantity : 77.0...79.0  
 1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 8.1

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.20  
Speed rpm : 300  
Rack travel in mm : 8.00...8.20

TORQUE CONTROL  
Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 800  
Rack travel in m: 11.80...12.00  
3rd speed rpm : 585  
Rack travel in m: 12.00...12.20  
4th speed rpm : 1100  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Pressure hPa : -  
Rack travel mm : 10.50...10.60

1st pressure hPa : 180  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 290  
Rack travel in m: 11.70...12.00  
3rd pressure hPa : 800  
Rack travel in m: 12.00...12.20

START CUT-OUT

Speed 1/min : 230 (250)

FUEL DELIVERY CHARACTERISTICS

1st version

B21

Aneroid pressure h: 800  
Speed rpm : 800  
Del.quantity cm3/ : 76.0...78.0  
1000 s: (74.0...80.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 800  
Speed rpm : 585  
Del.quantity cm3/ : 68.5...71.5  
1000 s: (66.0...74.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 39.0...41.0  
1000 s: (37.0...43.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 8.00...8.20  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P20
Edition : 21.06.90
replaces : -
Calibrating oil : ISO 4113
Injection pump : VE 4/12F1250 R359
Type number : 0 460 424 054

Customer-specific information
Customer : CUM

Engine : 4BTA

TEST BENCH REQUIREMENTS

Calibrating-oil
return temp. °C
with thermometer : 40...48
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder
assembly : 1 688 901 027

Opening
pressure bar : 0.35

Perforated-plate
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0
x Wall thickness : 2.0
x Length mm : 840.0

Start of delivery block
Piston stroke mm: 1.25
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 1100
Charge press. hPa: 1000
Setting value bar: 5.1...6.1

Full-load del. with charge press.:

Speed 1/min: 850
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 83.0...84.0
Dispersion cm3/ : 4.0
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500
Del.quantity cm3/
1000H.: 53.0...54.0

Low-idle speed regulation:

Speed 1/min: 375
Del.quantity cm3/
1000H.: 10.0...12.0
Dispersion cm3/: 5.5
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1330
Charge press. hPa: 1000
Del.quantity cm3/
1000H.: 68.0...74.0

Start:

Speed 1/min: 100
Del.quantity : -
mind cm3/1000H.: 80.0

Inspection-pump test specifications
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400
TD travel mm: 2.9...3.9
mm: (2.9...3.9)

2nd speed 1/min: 1000
Charge press. hPa: 1000
TD travel mm: 0.9...1.7
mm: (0.6...2.0)

3rd speed 1/min: 1100
Charge press. hPa: 1000
TD travel mm: 2.0...2.4
mm: (1.5...2.9)

4th speed 1/min: 1250
Charge press. hPa: 1000

TD travel mm: 2.8...3.6  
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.6...3.2  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.9...5.5  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.3...6.2  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.0...6.6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 535  
Del.quantity cm<sup>3</sup>/: 71.5...72.5  
1000H.: (68.0...76.0)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1430  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1330  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 68.0...74.0  
1000H.: (65.0...77.0)  
5th speed 1/min: 1250  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 76.5...79.5  
1000H.: (75.0...81.0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 77.5...80.5  
1000H.: (75.5...82.5)  
7th speed 1/min: 850

Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 83.0...84.0  
1000H.: (80.5...86.5)  
8th speed 1/min: 700  
Charge press. hPa: 535  
Del.quantity cm<sup>3</sup>/: 71.5...72.5  
1000H.: (68.0...76.0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 53.0...54.0  
1000H.: (49.5...57.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 10...12.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...2.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80.0

2nd speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 40.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : 3.7  
MS mm : 0.8...1.2  
SVS max. mm : 2.1  
XK mm : 21.8...23.8  
XL mm : 11.3...14.7



Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (44)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P22  
Edition : 19.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1250 R374  
Type number : 0 460 424 057  
  
Customer-specific information  
Customer : CUM  
  
Engine : 4BTA 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
  
Opening  
pressure bar : 250...253  
  
Perforated-plate  
diameter mm : 0.5  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0  
  
Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)  
  
Start of delivery block  
Piston stroke mm : 1.55  
mm: ±0.02(0.06)  
  
Outlet : A  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 850  
Charge press. hPa: 1000

Setting value mm: 4.0...4.4

Supply-pump pressure:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value bar: 5.6...6.2

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 85.5...86.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 64.5...65.5

Low-idle speed regulation:

Speed 1/min: 365  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1310  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H: 61.0...67.0

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1.8...2.6  
mm: (1.5...2.9)  
  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 4.0...4.4  
mm: (3.5...4.9)  
  
3rd speed 1/min: 1100  
Charge press. hPa: 1000

TD travel mm: 4.9...5.7  
mm: (4.6...6.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.0...4.6  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.6...6.2  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.7...7.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm<sup>3</sup>/: 79.5...81.5  
1000H.: (76.0...84.0)  
2nd speed 1/min: 1420  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1310  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 61.0...67.0  
1000H.: (58.0...70.0)  
5th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 74.5...77.5  
1000H.: (73.0...79.0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 77.0...80.0  
1000H.: (75.0...82.0)  
7th speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 85.5...86.5  
1000H.: (83.0...89.0)  
8th speed 1/min: 700

Charge press. hPa: 350  
Del. quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
9th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 63.5...64.5  
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 365  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 365  
Del. quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
ind. 1000H: 70.0  
2nd speed 1/min: 230  
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.0...1.4  
SVS max. mm : 2.4  
XK mm : 21.8...23.8  
XL mm : 13.2...16.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P21  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1250 R374  
Type number : 0 460 424 057  
Customer Part-No. : 3 916 926

Customer-specific information  
Customer : CUM

Engine : 4BTA 3.9 IND.

Power k: 88  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.55  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.0...4.4

## Supply-pump pressure:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value bar: 5.6...6.2

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 85.5...86.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H : (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 63.5...64.5

## Full-load speed regulation:

Speed 1/min: 1310  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H: 61.0...67.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1.8...2.6  
mm: (1.5...2.9)

2nd speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 4.0...4.4  
mm: (3.5...4.9)

3rd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 4.9...5.7  
mm: (4.6...6.0)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.0...4.6  
 2nd speed 1/min: 850  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 5.6...6.2  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.7...7.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow quantity cm<sup>3</sup>/10s: 41...83 (26...98)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138 (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 350  
 Del.quantity cm<sup>3</sup>/1000H.: 79.5...80.5 (76.0...84.0)  
 2nd speed 1/min: 1420  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...3.0  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 15.0...55.0  
 4th speed 1/min: 1310  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 61.0...67.0 (58.0...70.0)  
 5th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 75.5...76.5 (73.0...79.0)  
 6th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 77.0...80.0 (75.0...82.0)  
 7th speed 1/min: 850  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 85.5...86.5 (83.0...89.0)  
 8th speed 1/min: 700  
 Charge press. hPa: 350  
 Del.quantity cm<sup>3</sup>/1000H.: 79.5...81.5 (76.0...84.0)  
 9th speed 1/min: 500

Del.quantity cm<sup>3</sup>/1000H.: 63.5...64.5 (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
 Del.quantity cm<sup>3</sup>/1000H.: 0..3

Electr. shutoff:

Speed 1/min: 365  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...3.0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 365  
 Del.quantity cm<sup>3</sup>/1000H.: 8.0...14.0 (6.0...16.0)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...4.0

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Del.quantity cm<sup>3</sup>/ind. 1000H.: 70.0  
 2nd speed 1/min: 230  
 Del.quantity cm<sup>3</sup>/max. 1000H.: 60.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm : -  
 KF mm : 5.0...5.4  
 MS mm : 1.0...1.4  
 SVS max. mm : 2.4  
 XK mm : 21.8...23.8  
 XL mm : 13.2...16.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P24  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1150 R378  
Type number : 0 460 424 058  
Customer Part-No. : 3 717 508

Customer-specific information  
Customer : CUM

Engine : 4BT 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.8  
mm :  $\pm 0.02(0.06)$

Outlet : A

Injection pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

C03

Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 67.0...68.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 47.0...53.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.8...2.6  
mm: (0.5...1.9)  
2nd speed 1/min: 900  
TD travel mm: 2.0...2.4  
mm: (1.5...2.9)  
3rd speed 1/min: 1150  
TD travel mm: 3.2...4.0  
mm: (2.9...4.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.5...3.1  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.2...4.8  
3rd speed 1/min: 1150



Supply-pump  
pressure bar: 5.2...5.8

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 47.0...53.0  
1000H.: (44.0...56.0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 63.5...66.5  
1000H.: (62.0...68.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (64.5...70.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 69.5...73.5  
1000H.: (67.5...75.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 68.0...76.0  
1000H.: (66.0...78.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80.0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.1...1.3  
SVS max. mm : 4.0

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P25  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1150 R378  
Type number : 0 460 424 058  
Customer Part-No. : 3 917 508

Customer-specific information  
Customer : CUM

Engine : 4BT 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.8  
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2.0...2.4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.2...4.8

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 67.0...68.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/  
1000H.: 47.0...53.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.8...2.6  
mm: (0.5...1.9)  
2nd speed 1/min: 900  
TD travel mm: 2.0...2.4  
mm: (1.5...2.9)  
3rd speed 1/min: 1150  
TD travel mm: 3.2...4.0  
mm: (2.9...4.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.5...3.1  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.2...4.8  
3rd speed 1/min: 1150

Supply-pump  
pressure bar: 5.2...5.8

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)

2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -

2nd speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -

3rd speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 47.0...53.0  
1000H.: (44.0...56.0)

4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 63.5...66.5  
1000H.: (62.0...68.0)

5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (64.5...70.5)

6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 69.5...73.5  
1000H.: (67.5...75.5)

7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 68.0...76.0  
1000H.: (66.0...78.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)

2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80.0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.1...1.3  
SVS max. mm : 4.0

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P26  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1000 R378-1  
Type number : 0 460 424 059

Customer-specific information  
Customer : CUM

Engine : 4BTA 3.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.8  
mm :  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2.4...2.8

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.0...4.6

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 67.5...68.5  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 3.0...9.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1060  
Del.quantity cm<sup>3</sup>/  
1000H.: 50.5...56.5

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.3...2.1  
mm: (1.0...2.4)  
2nd speed 1/min: 900  
TD travel mm: 2.4...2.8  
mm: (1.9...3.3)  
3rd speed 1/min: 1000  
TD travel mm: 2.7...3.5  
mm: (2.4...3.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.2...2.8  
Timing valve volt: 900  
Supply-pump  
pressure bar: 4.0...4.6  
3rd speed 1/min: 1000

Supply-pump  
pressure bar: 4.4...5.0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1060  
Del.quantity cm<sup>3</sup>/: 50.5...56.5  
1000H.: (47.5...59.5)  
4th speed 1/min: 1000  
Del.quantity cm<sup>3</sup>/: 65.5...68.5  
1000H.: (64.0...70.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 67.5...68.5  
1000H.: (65.0...71.0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 70.0...74.0  
1000H.: (68.0...76.0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 70.0...78.0  
1000H.: (68.0...80.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : 350  
Del.quantity cm<sup>3</sup>/: 3.0...9.0  
1000H.: (1.0...11.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 90.0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 90.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.1...1.5  
SVS max. mm : 3.0

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P28  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1250 RV378-2  
Type number : 0 460 424 G60  
Customer Part-No. : 3 917 030

Customer-specific information  
Customer : CUM

Engine : 4BT 3.9 IND.

Power k: 63  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.8  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2.0...2.4

## Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.6...5.2

## Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 68.5...69.5  
Dispersion cm<sup>3</sup>/  
1000H.: (4.5)

## Low-idle speed regulation:

Speed 1/min: 335  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1290  
Del.quantity cm<sup>3</sup>/  
1000H.: 58.0...64.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0.8...1.6  
mm: (0.5...1.9)  
2nd speed 1/min: 900  
TD travel mm: 2.0...2.4  
mm: (1.5...2.9)  
3rd speed 1/min: 1100  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.7...3.3  
2nd speed 1/min: 750

Supply-pump  
pressure bar: 3.9...4.5  
3rd speed 1/min: 900  
Supply-pump  
pressure bar: 4.6...5.2  
4th speed 1/min: 1100  
Supply-pump  
pressure bar: 5.4...6.0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1360  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1290  
Del.quantity cm<sup>3</sup>/: 58.0...64.0  
1000H.: (55.0...67.0)  
4th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 66.5...69.5  
1000H.: (65.0...71.0)  
5th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 68.5...69.5  
1000H.: (66.0...72.0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 73.0...77.0  
1000H.: (71.0...79.0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 74.0...82.0  
1000H.: (72.0...84.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 335  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335

Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 75.0

2nd speed 1/min: 300  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 0.8...1.2  
SVS max. mm : 4.8

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P27  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1250 RV378-2  
Type number : 0 460 424 060  
Customer Part-No. : 3 917 511

Customer-specific information  
Customer : CUM

Engine : 4BT 3.9 IND.

Power k: 74  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.8  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2.0...2.4

## Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.6...5.2

## Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 68.5...69.5  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

## Low-idle speed regulation:

Speed 1/min: 335  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1290  
Del.quantity cm<sup>3</sup>/  
1000H: 58.0...64.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0.8...1.6  
mm: (0.5...1.9)  
2nd speed 1/min: 900  
TD travel mm: 2.0...2.4  
mm: (1.5...2.9)  
3rd speed 1/min: 1100  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.7...3.3  
2nd speed 1/min: 750



Supply-pump  
pressure bar: 3.9...4.5  
3rd speed 1/min: 900  
Supply-pump  
pressure bar: 4.6...5.2  
4th speed 1/min: 1100  
Supply-pump  
pressure bar: 5.4...6.0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450  
Del.quantity cm3/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1360  
Del.quantity cm3/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1290  
Del.quantity cm3/: 58.0...64.0  
1000H.: (55.0...67.0)  
4th speed 1/min: 1250  
Del.quantity cm3/: 66.5...69.5  
1000H.: (65.0...71.0)  
5th speed 1/min: 1100  
Del.quantity cm3/: 68.5...69.5  
1000H.: (66.0...72.0)  
6th speed 1/min: 750  
Del.quantity cm3/: 73.0...77.0  
1000H.: (71.0...79.0)  
7th speed 1/min: 500  
Del.quantity cm3/: 74.0...82.0  
1000H.: (72.0...84.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm3/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 335  
ELAB volt: -  
Del.quantity cm3/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 335

Del.quantity cm3/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H: 75.0

2nd speed 1/min: 300  
Del.quantity cm3/: -  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 0.8...1.2  
SVS max. mm : 4.8

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P29  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1050 R378-3  
Type number : 0 460 424 061  
Customer Part-No. : 3 916 927

Customer-specific information  
Customer : CUM

Engine : 4BT 390 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.8  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900

Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 69.0...70.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 10.0...12.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1110  
Del.quantity cm<sup>3</sup>/  
1000H.: 49.0...55.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.3...2.1  
mm: (1.0...2.4)  
2nd speed 1/min: 900  
TD travel mm: 2.3...2.7  
mm: (1.8...3.2)  
3rd speed 1/min: 1050  
TD travel mm: 2.8...3.6  
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.3...2.9  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.1...4.7  
3rd speed 1/min: 1050

Supply-pump pressure bar: 4.8...5.4  
Overflow quantity at overflow valve:  
1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1140  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1110  
Del.quantity cm<sup>3</sup>/: 49.0...55.0  
1000H.: (46.0...58.0)  
4th speed 1/min: 1050  
Del.quantity cm<sup>3</sup>/: 66.0...69.0  
1000H.: (64.5...70.5)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 69.0...70.0  
1000H.: (66.5...72.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 72.0...76.0  
1000H.: (70.0...78.0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 72.0...80.0  
1000H.: (70.0...82.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 10...12.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80.0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.1...1.5  
SVS max. mm : 3.8

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P23  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1150 R374-1  
Type number : 0 460 424 063  
Customer Part-No. : 3 917 021

Customer-specific information  
Customer : CUM

Engine : 4BTA 3.9 IND.

Power k: 82  
Speed 1/mi: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.55  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.0...4.4

## Supply-pump pressure:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value bar: 5.6...6.2

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 85.5...86.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 79.5...80.5

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1220  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 62.5...68.5

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1.8...2.6  
mm: (1.5...2.9)  
2nd speed 1/min: 850  
Charge press. hPa: 1000

TD travel mm: 4.0...4.4  
mm: (3.5...4.9)  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
TD travel mm: 5.2...6.0  
mm: (4.9...6.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.0...4.6  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.6...6.2  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.9...7.5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del.quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
2nd speed 1/min: 1320  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1260  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1220  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 62.5...68.5  
1000H.: (59.5...71.5)  
5th speed 1/min: 1150  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 76.0...79.0  
1000H.: (74.5...80.5)  
6th speed 1/min: 1000  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 79.5...82.5  
1000H.: (77.5...84.5)  
7th speed 1/min: 850

Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 85.5...86.5  
1000H.: (83.0...89.0)  
8th speed 1/min: 700  
Charge press. hPa: 350  
Del.quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 63.5...64.5  
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 60.0  
2nd speed 1/min: 230  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.0...1.4  
SVS max. mm : 2.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P33  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1400 R389-1  
Type number : 0 460 424 066

Customer-specific information  
Customer : CUM

Engine : 4BT-390

Power k: 77  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.66  
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value bar: 4.7...5.3

Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm3/  
1000H.: 69.5...70.5  
Dispersion cm3/ : 4.0  
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm3/  
1000H.: 36.5...37.5

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8.0...14.0  
Dispersion cm3/ : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del.quantity cm3/  
1000H: 54.0..60.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 40.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900  
Charge press. hPa: 1000  
TD travel mm: 0.3...1.1  
mm: (0.0...1.4)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

TD travel mm: 1.8...2.2  
mm: (1.3...2.7)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.1...2.7  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.9...6.5

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.5...71.5)  
2nd speed 1/min: 1650  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1590  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1500  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 54.0...60.0  
1000H.: (51.0...63.0)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 64.5...67.5  
1000H.: (63.0...69.0)  
6th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 69.5...70.5  
1000H.: (67.0...73.0)  
7th speed 1/min: 700

Charge press. hPa: 400  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.5...71.5)  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 36.5...37.5  
1000H.: (33.0...41.0)

#### Zero delivery (stop):

##### Mech. shutoff:

Speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

##### Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

#### Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 40.0  
2nd speed 1/min: 380  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 40.0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

##### Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 0.8...1.2  
SVS max. mm : 2.7

#### Remarks:

Operate control lever after each manifold-pressure compensator pressure change.



\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P32  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1400 R389-1  
Type number : 0 460 424 066  
Customer Part-No. : 3 917 018

Customer-specific information  
Customer : CUM

Engine : 4BT-390

Power k: 77  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.66  
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.8...2.2

## Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value bar: 4.7...5.3

## Full-load del. with charge press.:

Speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 69.5...70.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H : (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 36.5...37.5

## Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 54.0..60.0

## Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 40.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 900  
Charge press. hPa: 1000  
TD travel mm: 0.3...1.1  
mm: (0.0...1.4)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

TD travel mm: 1.8...2.2  
mm: (1.3...2.7)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.1...2.7  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.9...6.5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.5...71.5)  
2nd speed 1/min: 1650  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1590  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1500  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 54.0...60.0  
1000H.: (51.0...63.0)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 64.5...67.5  
1000H.: (63.0...69.0)  
6th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 69.5...70.5  
1000H.: (67.0...73.0)  
7th speed 1/min: 700

Charge press. hPa: 400  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.5...71.5)  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 36.5...37.5  
1000H.: (33.0...41.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 40.0  
2nd speed 1/min: 380  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 40.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 0.8...1.2  
SVS max. mm : 2.7

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 N32  
Edition : 10.07.90  
replaces : 17.01.90  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1400 R390  
Type number : 0 460 424 067

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9

Power k: 92  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840

Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.95  
mm: ±0.02(0.06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2.2...2.6

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value bar: 5.7...6.3

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 82.0...83.0  
Dispersion cm<sup>3</sup> / : 4.0  
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 55.5...56.5

Low-idle speed regulation:

Speed 1/min: 400  
Charge press. hPa: -  
Del.quantity cm<sup>3</sup>/  
1000H.: 4.0...6.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 48.5...54.5

Start:

Speed 1/min: 100  
Charge press. hPa: -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 0.7...1.5  
mm: (0.4...1.8)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

TD travel mm: 2.2...2.6  
mm: (1.7...3.1)  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
TD travel mm: 2.8...3.6  
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.2...3.8  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.7...6.3  
4th speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.3...6.9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 330  
Del. quantity cm<sup>3</sup>/: 64.5...65.5  
1000H.: (61.0...69.0)  
2nd speed 1/min: 1640  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1560  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 15.0...45.0  
1000H.: -  
4th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 48.5...54.5  
1000H.: (45.5...57.5)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 71.0...74.0  
1000H.: (69.5...75.5)

6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 77.0...80.0  
1000H.: (75.0...82.0)  
7th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 82.0...83.0  
1000H.: (79.5...85.5)  
8th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 94.0...104.0  
1000H.: -  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 55.5...56.5  
1000H.: (52.0...60.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 400  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4.0...6.0  
1000H.: (0.0...10.0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 230  
Charge press. hPa: -  
ind. 1000H: 80.0  
2nd speed 1/min: 400  
Charge press. hPa: -  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : K-OT  
MS mm : 1.0...1.4  
SVS max. mm : 1.2

Remarks:

Overflow restriction 0.75 mm - Part No.  
..343,..344

\* Correction at adjusting nut (46)



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P30  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1050 R378-6  
Type number : 0 460 424 071

Customer-specific information  
Customer : CUM

Engine : 4BT 390 IND.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.8  
mm :  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2.3...2.7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 65.5...66.5  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 370  
Del.quantity cm<sup>3</sup>/  
1000H.: 15.0...17.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1085  
Del.quantity cm<sup>3</sup>/  
1000H.: 52.0...58.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 65.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1.3...2.1  
mm: (1.0...2.4)  
2nd speed 1/min: 900  
TD travel mm: 2.3...2.7  
mm: (1.8...3.2)  
3rd speed 1/min: 1050  
TD travel mm: 2.8...3.6  
mm: (2.5...3.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.5...3.1  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4.1...4.7  
3rd speed 1/min: 1050



Supply-pump  
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1190  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1120  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1085  
Del.quantity cm<sup>3</sup>/: 52.0...58.0  
1000H.: (49.0...61.0)  
4th speed 1/min: 1050  
Del.quantity cm<sup>3</sup>/: 62.5...65.5  
1000H.: (61.0...67.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 65.5...66.5  
1000H.: (63.0...69.0)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 66.5...70.5  
1000H.: (64.5...72.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 66.0...74.0  
1000H.: (64.0...76.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 370  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 370  
Del.quantity cm<sup>3</sup>/: 15...17.0  
1000H.: (11...21.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70.0

2nd speed 1/min: 240  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 70.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.1...1.5
SVS max.	mm	: 3.8
XK	mm	: 18.8...20.8
XL	mm	: 10.9...14.3

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3.9 P31  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1050 R389  
Type number : 0 460 426 065  
Customer Part-No. : 3 917 517

Customer-specific information  
Customer : CUM

Engine : 4BT-390 AUTOM.

Power k: 78  
Speed 1/mi: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.2  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.0  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3.4...3.8

## Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 5.0...5.6

## Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 89.5...90.5  
Dispersion cm<sup>3</sup>/ : 4.0  
1000H : (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 63.5...64.5

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/ : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H: 59.0...65.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1.7...2.5  
mm: (1.4...2.8)

2nd speed 1/min: 750  
Charge press. hPa: 1000

TD travel mm: 3.4...3.8  
mm: (2.9...4.3)  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 4.7...5.5  
mm: (4.4...5.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.9...4.5  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.0...5.6  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.3...6.9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
2nd speed 1/min: 1180  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1120  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 59.0...65.0  
1000H.: (56.0...68.0)  
5th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 76.5...79.5  
1000H.: (75.0...81.0)  
6th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 89.5...90.5  
1000H.: (87.0...93.0)  
7th speed 1/min: 700

Charge press. hPa: 350  
Del. quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 63.5...64.5  
1000H.: (60.0...68.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60.0  
2nd speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
max. 1000H: 60.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.6...6.0  
MS mm : 0.9...1.3  
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W55  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R372  
Type number : 0 460 426 141  
Customer Part-No. : 3 916 948

Customer-specific information  
Customer : CUM

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.5  
mm :  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750

Setting value mm: 3.4...3.8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3.5...4.1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 68.5...71.5

Low-idle speed regulation:

Speed 1/min: 360  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/  
1000H.: 51.0...57.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.3...2.1  
mm: (1.0...2.4)  
2nd speed 1/min: 750  
TD travel mm: 3.4...3.8  
mm: (2.9...4.3)  
3rd speed 1/min: 1100  
TD travel mm: 5.2...6.0  
mm: (4.9...6.3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.4...3.0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3.5...4.1  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41...83  
 quantity cm3/10s: (26...98)  
 2nd speed 1/min: 1250  
 Overflow : 55...138  
 quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
 Del.quantity cm3/: 0.0...3.0  
 1000H.: -  
 2nd speed 1/min: 1390  
 Del.quantity cm3/: 0.0...15.0  
 1000H.: -  
 3rd speed 1/min: 1350  
 Del.quantity cm3/: 15.0...55.0  
 1000H.: -  
 4th speed 1/min: 1300  
 Del.quantity cm3/: 51.0...57.0  
 1000H.: (48.0...60.0)  
 5th speed 1/min: 1250  
 Del.quantity cm3/: 68.5...71.5  
 1000H.: (67.0...73.0)  
 6th speed 1/min: 1100  
 Del.quantity cm3/: 73.0...74.0  
 1000H.: (70.5...76.5)  
 7th speed 1/min: 900  
 Del.quantity cm3/: 74.5...78.5  
 1000H.: (72.5...80.5)  
 8th speed 1/min: 500  
 Del.quantity cm3/: 64.0...72.0  
 1000H.: (62.0...74.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
 Del.quantity cm3/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 360  
 ELAB volt: -  
 Del.quantity cm3/: 0.0...3.0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 360  
 Del.quantity cm3/: 8.0...14.0  
 1000H.: (6.0...16.0)  
 2nd speed 1/min: 450  
 Del.quantity cm3/: 0.0...4.0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
 Del.quantity cm3/: -  
 ind. 1000H.: 70.0  
 2nd speed 1/min: 240  
 Del.quantity cm3/: -  
 max. 1000H.: 70.0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 0.6...1.0
XK	mm	: 18.8...20.8
XL	mm	: 11.1...14.5

Remarks:

Heavy-duty fuel-injection pump for  
 DI-engines: only test using timing-  
 device-travel measuring device with  
 metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W5  
Edition : 20.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1325 R367-1  
Type number : 0 460 426 146  
Customer Part-No. : 3 916 905

Customer-specific information  
Customer : CUM

Engine : 6BT 5.9 IND.

Power k: 97  
Speed 1/mi: 2650

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 0.35

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): +0.02(0.04)

Start of delivery block  
Piston stroke mm: 1.5  
mm: +0.02(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 850  
Setting value mm: 3.9...4.3

## Supply-pump pressure:

Speed 1/min: 850  
Setting value bar: 3.9...4.5

## Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm3/  
1000H.: 56.0...57.0  
Dispersion cm3/ : 4.0  
1000H.: (4.5)

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8.0...14.0  
Dispersion cm3/ : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1400  
Del.quantity cm3/  
1000H.: 36.0...42.0

## Start:

Speed 1/min: 100  
mind cm3/1000H.: 60.0

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.3...2.1  
mm: (1.0...2.4)  
2nd speed 1/min: 850  
TD travel mm: 3.9...4.3  
mm: (3.4...4.8)  
3rd speed 1/min: 1100  
TD travel mm: 5.9...6.7  
mm: (5.6...7.0)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.5...3.1  
2nd speed 1/min: 850

Supply-pump  
pressure bar: 3.9...4.5  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.9...5.5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1325  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1520  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1440  
Del.quantity cm<sup>3</sup>/: 15.0...45.0  
1000H.: -  
3rd speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 36.0...42.0  
1000H.: (33.0...45.0)  
4th speed 1/min: 1325  
Del.quantity cm<sup>3</sup>/: 52.5...55.5  
1000H.: (51.0...57.0)  
5th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 56.0...57.0  
1000H.: (53.5...59.5)  
6th speed 1/min: 850  
Del.quantity cm<sup>3</sup>/: 53.5...57.5  
1000H.: (51.5...59.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 38.5...46.5  
1000H.: (36.5...48.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1325  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450

Del.quantity cm<sup>3</sup>/: 9.0...13.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
ind. 1000H.: 65.0

2nd speed 1/min: 250  
max. 1000H.: 65.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.3...1.7

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W60  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R376  
Type number : 3 917 560

Customer-specific information  
Customer : CUM

Engine : 6BT-5.9 IND.

Power k: 104  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3.1...3.5

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 4.1...4.7

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 83.5...84.5  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 360  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/  
1000H.: 56.0...62.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 80.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.0...1.8  
mm: (0.7...2.1)

2nd speed 1/min: 750  
TD travel mm: 3.1...3.5  
mm: (2.6...4.0)

3rd speed 1/min: 1100  
TD travel mm: 5.6...6.4  
mm: (5.3...6.7)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3.0...3.6  
2nd speed 1/min: 750

Supply-pump  
pressure bar: 4.1...4.7  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.7...6.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1175  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 56.0...62.0  
1000H.: (53.0...65.0)  
4th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 69.5...72.5  
1000H.: (68.0...74.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 71.5...74.5  
1000H.: (69.5...76.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 83.5...84.5  
1000H.: (81.0...87.0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 81.0...89.0  
1000H.: (79.0...91.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 360  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 360  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 460

Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 95.0

2nd speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 95.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.2...1.6  
SVS max. mm : 1.8  
XK mm : 18.8...20.8  
XL mm : 11.9...15.3

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W61  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1400 R377  
Type number : 0 460 426 148  
Customer Part-No. : 3 916 907

Customer-specific information

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W62  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1400 R377  
Type number : 0 460 426 148  
Customer Part-No. : 3 916 907

Customer-specific information  
Customer : CUM

Engine : 6BTA-5.9 IND.

Power k: 143  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 2.4  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.5...1.9

## Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value bar: 6.3...6.9

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 82.5...83.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H : (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 73.0...74.0

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1510  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H: 56.0...62.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 100.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 0.8...1.6  
mm: (0.5...1.9)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000

TD travel mm: 1.5...1.9  
mm: (1.0...2.4)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 2.7...3.5  
mm: (2.4...3.8)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.5...4.1  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.3...6..9  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.7...8.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 550  
Del. quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
2nd speed 1/min: 1650  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1550  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1510  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 56.0...62.0  
1000H.: (53.0...65.0)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 75.5...78.5  
1000H.: (74.0...80.0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 80.0...83.0  
1000H.: (78.0...85.0)  
7th speed 1/min: 850

Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 82.5...83.5  
1000H.: (80.0...86.0)  
8th speed 1/min: 700  
Charge press. hPa: 550  
Del. quantity cm<sup>3</sup>/: 79.5...80.5  
1000H.: (76.0...84.0)  
9th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 73.0...74.0  
1000H.: (69.5...77.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 240  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 90.0  
2nd speed 1/min: 370  
Del. quantity cm<sup>3</sup>/: -  
max. 1000H : 100.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
MS mm : 0.8...1.2  
SVS max. mm : 3.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W57  
 Edition : 19.06.90  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R373-4  
 Type number : 0 460 426 150

Customer-specific information  
 Customer : CUM

Engine : 6BT-590

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
 x Wall thickness : 2.0  
 x Length mm : 840.0

Start of delivery  
 Prestroke mm : 0.3  
 (from BDC): ±0.02(0.04)

Start of delivery block  
 Piston stroke mm: 1.85  
 mm: ±0.02(0.04)

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
 Charge press. hPa: 1000

Setting value mm: 1.4...1.8

Supply-pump pressure:

Speed 1/min: 750  
 Charge press. hPa: 1000  
 Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 82.0...83.0  
 Dispersion cm<sup>3</sup> / : 4.0  
 1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 40.0...41.0

Low-idle speed regulation:

Speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 4.0...8.0  
 Dispersion cm<sup>3</sup> / : 5.5  
 1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1300  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H: 65.0...71.0

Start:

Speed 1/min: 100  
 mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 TD travel mm: 0.4...1.2  
 mm: (0.1...1.5)

2nd speed 1/min: 750  
 Charge press. hPa: 1000  
 TD travel mm: 1.4...1.8  
 mm: (0.9...2.3)

3rd speed 1/min: 1050  
 Charge press. hPa: 1000

TD travel mm: 2.3...3.1  
mm: (2.0...3.4)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.1...2.7  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.2...3.8  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.3...4.9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 450  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.0...72.0)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1330  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1300  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 65.0...71.0  
1000H.: (62.0...74.0)  
5th speed 1/min: 1250  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 73.5...76.5  
1000H.: (72.0...78.0)  
6th speed 1/min: 1050  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 78.0...81.0  
1000H.: (76.5...82.5)  
7th speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 82.0...83.0  
1000H.: (79.5...85.5)  
8th speed 1/min: 700

Charge press. hPa: 450  
Del.quantity cm<sup>3</sup>/: 67.0...68.0  
1000H.: (63.0...72.0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 40.0...41.0  
1000H.: (36.0...45.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 4.0...8.0  
1000H.: (1.0...11.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200  
ind. 1000H: 60.0  
2nd speed 1/min: 370  
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.2...1.6  
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)



Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W59  
Edition : 19.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R373-5  
Type number : 0 460 426 151  
  
Customer-specific information  
Customer : CUM  
  
Engine : 6BT 5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
  
Opening  
pressure bar : 250...253  
  
Perforated-plate  
diameter mm : 0.5  
  
Test inj. tubing : 1 688 901 027  
  
Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0  
  
Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)  
  
Start of delivery block  
Piston stroke mm: 1.85  
mm: ±0.02(0.06)  
  
Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000

Setting value mm: 1.3...1.7

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3.2...3.8

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 83.0...84.0  
Dispersion cm<sup>3</sup> / : 4.0  
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 67.5...68.5  
Dispersion cm<sup>3</sup> / : 9.0  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 9.0...13.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 60.0...66.0

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 80.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0.4...1.2  
mm: (0.1...1.5)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: 1.3...1.7  
mm: (0.8...2.2)  
3rd speed 1/min: 1100

Charge press. hPa: 1000  
TD travel mm: 2.2...3.0  
mm: (1.9...3.0)  $\Delta$

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.6...3.2  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.2...3.8  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700\*  
Charge-air pressure-setting point hPa: 400  
Del.quantity cm<sup>3</sup>/: 77.5...78.5  
1000H.: (73.5...82.5)  
2nd speed 1/min: 1260  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1150  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 60.0...66.0  
1000H.: (57.0...69.0)  
5th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 78.5...81.5  
1000H.: (77.0...83.0)  
6th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 80.5...83.5  
1000H.: (79.0...85.0)  
7th speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 83.0...84.0  
1000H.: (80.5...86.5)

8th speed 1/min: 700  
Charge press. hPa: 400  
Del.quantity cm<sup>3</sup>/: 77.5...78.5  
1000H.: (73.5...82.5)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 67.5...68.5  
1000H.: (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 9.0...13.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 280  
ind. 1000H: 80.0  
2nd speed 1/min: 440  
max. 1000H : 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.0...1.4

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W58  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1100 R373-5  
Type number : 0 460 426 151  
Customer Part-No. : 3 916 911

Customer-specific information  
Customer : CUM

Engine : 6BT 5.9 IND.

Power k: 128  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.85  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1.3...1.7

## Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3.2...3.8

## Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 83.0...84.0  
Dispersion cm<sup>3</sup> / : 4.0  
1000H : (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 67.5...68.5  
Dispersion cm<sup>3</sup> / : 9.0  
1000H.: (9.0)

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 9.0...13.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1150  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H: 60.0...66.0

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 80.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0.4...1.2  
mm: (0.1...1.5)

2nd speed 1/min: 750  
 Charge press. hPa: 1000  
 TD travel mm: 1.3...1.7  
                   mm: (0.8...2.2)  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD travel mm: 2.2...3.0  
                   mm: (1.9...3.3)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 2.6...3.2  
 2nd speed 1/min: 750  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.2...3.8  
 3rd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4.7...5.3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow quantity cm<sup>3</sup>/10s: 41...83  
   (26...98)  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138  
   (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 400  
 Del.quantity cm<sup>3</sup>/1000H.: 77.5...78.5  
   (73.5...82.5)  
 2nd speed 1/min: 1260  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...3.0  
   -  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 15.0...55.0  
   -  
 4th speed 1/min: 1150  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 60.0...66.0  
   (57.0...69.0)  
 5th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 78.5...81.5  
   (77.0...83.0)  
 6th speed 1/min: 900  
 Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/1000H.: 80.5...83.5  
   (79.0...85.0)  
 7th speed 1/min: 750  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/1000H.: 83.0...84.0  
   (80.5...86.5)  
 8th speed 1/min: 700  
 Charge press. hPa: 400  
 Del.quantity cm<sup>3</sup>/1000H.: 77.5...78.5  
   (73.5...82.5)  
 9th speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/1000H.: 67.5...68.5  
   (63.5...72.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
 Del.quantity cm<sup>3</sup>/1000H.: 0...3  
   -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...3.0  
 max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/1000H.: 9.0...13.0  
   (6.0...16.0)  
 2nd speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/1000H.: 0.0...4.0  
   -

Automatic starting fuel delivery:

1st speed 1/min: 280  
 Del.quantity cm<sup>3</sup>/ind. 1000H.: -  
   80.0  
 2nd speed 1/min: 440  
 Del.quantity cm<sup>3</sup>/ind. 1000H.: -  
   80.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm : -  
 KF mm : 5.0...5.4  
 MS mm : 1.0...1.4

Remarks:  
Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W49  
 Edition : 03.05.90  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R381-2  
 Type number : 0 460 426 154  
 Customer Part-No. : 3 917 011

Customer-specific information  
 Customer : CDC

Engine : 6 BT - 5.9 IND.

Power k: 93.0  
 Speed 1/mi: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0.3  
 (from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
 Piston stroke mm : 1.5  
 mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 750  
 Setting value mm: 3.4...3.8

## Supply-pump pressure:

Speed 1/min: 750  
 Setting value bar: 3.5...4.1

## Full-load del. w/out charge press.:

Speed 1/min : 750  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 61.0...62.0  
 Dispersion cm<sup>3</sup>/: 4.0  
 1000H.: (4.5)

## Low-idle speed regulation:

Speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 10.0...12.0  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1150  
 Del.quantity cm<sup>3</sup>/  
 1000H: 39.0...45.0

## Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 75.0

Inspection-pump test specifications  
 Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 1.5...2.3  
 mm: (1.2...2.6)  
 2nd speed 1/min: 750  
 TD travel mm: 3.4...3.8  
 mm: (2.9...4.3)  
 3rd speed 1/min: 1100  
 TD travel mm: 5.6...6.4  
 mm: (5.3...6.7)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 2.4...3.0  
 2nd speed 1/min: 750



Supply-pump  
pressure bar: 3.5...4.1  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 4.8...5.4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1170  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: (15.0...55.0)  
3rd speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 39.0...45.0  
1000H.: (36.0...48.0)  
4th speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 58,5...61,5  
1000H.: (57.0...63.0)  
5th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 60,0...63,0  
1000H.: (59.5...66.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 62.0...63.0  
1000H.: (59.5...65.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 57.0...65.0  
1000H.: -

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 10...12  
1000H.: (6.0...16.0)  
2nd speed 1/min: 500

Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: (0.0...4.0)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 70.0

2nd speed 1/min: 300  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 80.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.2...1.6  
SVS max. mm : -

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W25  
 Edition : 18.06.90  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R371-1  
 Type number : 0 460 426 158

Customer-specific information  
 Customer : CASE

Engine : 6T-590

### TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
 x Wall thickness : 2  
 x Length mm : 840

Start of delivery  
 Prestroke mm : 0,2  
 (from BDC): +0,02(0,04)

Start of delivery block  
 Piston stroke mm : 1,5  
 mm : +0,02(0,06)

Outlet : D

Injection-pump setting values  
 Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
 Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 750  
 Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 750  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 57,5...58,5  
 Dispersion cm<sup>3</sup>/: 4,0  
 1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 9,0...13,0  
 Dispersion cm<sup>3</sup>/: 5,5  
 1000H.: (7,0)

Full-load speed regulation:

Speed 1/min: 1160  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 37,0...43,0

Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 65,0

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
 TD travel mm: 1,0...1,8  
 mm: (0,7...2,1)

2nd speed 1/min: 750  
 TD travel mm: 3,1...3,5  
 mm: (2,6...4,0)

3rd speed 1/min: 1100  
 TD travel mm: 5,4...6,2  
 mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 3,8...4,4  
 2nd speed 1/min: 750  
 Supply-pump  
 pressure bar: 4,9...5,5  
 3rd speed 1/min: 1100

Supply-pump  
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1180  
Del.quantity cm<sup>3</sup>/: 13,0...33,0  
1000H.: -  
3rd speed 1/min: 1160  
Del.quantity cm<sup>3</sup>/: 37,0...43,0  
1000H.: (34,0...46,0)  
4th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 55,5...58,5  
1000H.: (54,0...60,0)  
5th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 57,5...58,5  
1000H.: (55,0...61,0)  
6th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 40,5...48,5  
1000H.: (38,5...50,5)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 9,0...13,0  
1000H.: (6,0...16,0)  
2nd speed 1/min: 550  
Del.quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 65.0  
2nd speed 1/min: 350

Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 57,5

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,0...5,4
MS	mm	: 0,8...1,2
SVS max.	mm	: 4,1
XK	mm	: 18,8...20,8
XL	mm	: 10,2...13,6

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W16  
Edition : 21.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R367-2  
Type number : 0 460 426 165  
Customer Part-No. : 3 916 939

Customer-specific information  
Customer : CUM

Engine : 6BTA 5.9 IND.

Power k: 105  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3.8...4.2

## Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3.6...4.2

## Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 69.0...70.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

## Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8.0...14.0  
Dispersion cm<sup>3</sup>/: 5.5  
1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/  
1000H.: 52.5...58.5

## Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.6...2.4  
mm: (1.3...2.7)

2nd speed 1/min: 750  
TD travel mm: 3.8...4.2  
mm: (3.3...4.7)

3rd speed 1/min: 1100  
TD travel mm: 6.0...6.8  
mm: (5.7...7.1)

## Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.4...3.0  
2nd speed 1/min: 750

Supply-pump  
pressure bar: 3.6...4.2  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.1...5.7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1220  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1180  
Del.quantity cm<sup>3</sup>/: 0.0...15.0  
1000H.: -  
3rd speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/: 52.5...58.5  
1000H.: (49.5...61.5)  
4th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 63.5...66.5  
1000H.: (62.0...68.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 65.5...69.5  
1000H.: (63.5...71.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 69.0...70.0  
1000H.: (66.5...72.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 67.5...75.5  
1000H.: (65.5...77.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 8.0...14.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 520

Del.quantity cm<sup>3</sup>/: 0.5...4.5  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 65.0

2nd speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 60.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.0...1.4

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W11  
Edition : 18.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1250 R367-2  
Type number : 0 460 426 165

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3.8...4.2

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3.6...4.2

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 62.0...63.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 400  
Del.quantity cm<sup>3</sup>/  
1000H.: 6.0...12.0

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/  
1000H: 48.0...54.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.6...2.4  
mm: (1.3...2.7)  
2nd speed 1/min: 750  
TD travel mm: 3.8...4.2  
mm: (3.3...4.7)  
3rd speed 1/min: 1100  
TD travel mm: 6.0...6.8  
mm: (5.7...7.1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.4...3.0  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3.6...4.2  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.1...5.7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1430  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
2nd speed 1/min: 1360  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
3rd speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 48.0...54.0  
1000H.: (45.0...57.0)  
4th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 57.5...60.5  
1000H.: (56.0...62.0)  
5th speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 59.5...63.5  
1000H.: (57.5...65.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 62.0...63.0  
1000H.: (59.5...65.5)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 56.0...64.0  
1000H.: (54.0...66.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 400  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
Del.quantity cm<sup>3</sup>/: 6.0...12.0  
1000H.: (4.0...14.0)  
2nd speed 1/min: 520  
Del.quantity cm<sup>3</sup>/: 0.5...4.5  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
ind. 1000H: 65.0

2nd speed 1/min: 250  
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5,4
MS	mm	:	1,0...1,4
SVS max.	mm	:	1.1

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W67  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R402  
Type number : 0 460 426 166  
  
Customer-specific information  
Customer : CUM  
  
Engine : 6BTA-590 I

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
  
Opening  
pressure bar : 250...253  
  
Perforated-plate  
diameter mm : 0.5  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0  
  
Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)  
  
Start of delivery block  
Piston stroke mm: 1.5  
mm: ±0.02(0.06)  
  
Outlet : D  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 900  
Charge press. hPa: 1000

Setting value mm: 4.8...5.2

Supply-pump pressure:

Speed 1/min: 900  
Charge press. hPa: 1000  
Setting value bar: 4.7...5.3

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm3/  
1000H.: 71.5...72.5  
Dispersion cm3/ : 4.0  
1000H : (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 700  
Del.quantity cm3/  
1000H.: 51.0...52.0

Low-idle speed regulation:

Speed 1/min: 400  
Del.quantity cm3/  
1000H.: 7.0...13.0  
Dispersion cm3/ : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1180  
Charge press. hPa: 1000  
Del.quantity cm3/  
1000H: 47.0...53.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 75.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: 3.5...4.3  
mm: (3.2...4.6)  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
TD travel mm: 4.8...5.2  
mm: (4.3...5.5)  
3rd speed 1/min: 1100  
Charge press. hPa: 1000



TD travel mm: 6.2...7.0  
mm: (5.9...7.3)

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.0...4.6  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.5...6.1

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 450  
Del.quantity cm<sup>3</sup>: 64.5...65.5  
1000H.: (61.0...69.0)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 22.5...37.5  
1000H.: -  
4th speed 1/min: 1180  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 47.0...53.0  
1000H.: (44.0...56.0)  
5th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 59.5...62.5  
1000H.: (58.0...64.0)  
6th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 61.5...64.5  
1000H.: (59.5...66.5)  
7th speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>: 71.5...72.5  
1000H.: (69.0...75.0)  
8th speed 1/min: 700

Charge press. hPa: 450  
Del.quantity cm<sup>3</sup>: 64.5...65.5  
1000H.: (61.0...69.0)  
9th speed 1/min: 700  
Del.quantity cm<sup>3</sup>: 51.0...52.0  
1000H.: (47.5...55.5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 400  
ELAB volt: -  
Del.quantity cm<sup>3</sup>: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 400  
Del.quantity cm<sup>3</sup>: 7.0...13.0  
1000H.: (5.0...15.0)  
2nd speed 1/min: 500  
Del.quantity cm<sup>3</sup>: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del.quantity cm<sup>3</sup>: -  
ind. 1000H: 70.0  
2nd speed 1/min: 400  
Del.quantity cm<sup>3</sup>: -  
max. 1000H : 45.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5.0...5.4  
MS mm : 1.3...1.7  
SVS max. mm : 3.0  
XK mm : 21.8...23.8  
XL mm : 12.4...15.8

Remarks:

Operate control lever after each

manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 W17  
Edition : 18.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1000 R369-1  
Type number : 0 460 426 167

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.5  
mm :  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3.5...3.9

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3.6...4.2

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 73.0...74.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: 4.5

Low-idle speed regulation:

Speed 1/min: 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 4.0...10.0  
Dispersion cm<sup>3</sup>/: 3.5  
1000H.: 7.0

Full-load speed regulation:

Speed 1/min: 1045  
Del.quantity cm<sup>3</sup>/  
1000H: 60.0...66.0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1.4...2.2  
mm: (1.1...2.5)  
2nd speed 1/min: 750  
TD travel mm: 3.5...3.9  
mm: (3.3...4.4)  
3rd speed 1/min: 1000  
TD travel mm: 4.8...5.6  
mm: (4.5...5.9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.6...3.2  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3.6...4.2  
3rd speed 1/min: 1000

Supply-pump  
pressure bar: 4.6...5.2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1170  
Del.quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 25.0...45.0  
1000H.: -  
3rd speed 1/min: 1045  
Del.quantity cm<sup>3</sup>/: 60.0...66.0  
1000H.: (57.0...69.0)  
4th speed 1/min: 1000  
Del.quantity cm<sup>3</sup>/: 69.5...72.5  
1000H.: (69.0...75.0)  
5th speed 1/min: 900  
Del.quantity cm<sup>3</sup>/: 72.0...73.0  
1000H.: (70.5...76.5)  
6th speed 1/min: 750  
Del.quantity cm<sup>3</sup>/: 74.0...78.0  
1000H.: (72.0...80.0)  
7th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 58.5...66.5  
1000H.: (56.5...68.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1000  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 500  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 4.0...10.0  
1000H.: (2.0...12.0)  
2nd speed 1/min: 540  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 80,0

2nd speed 1/min: 250  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 60

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.2
MS	mm	: 1.0
SVS max.	mm	: 1.2
FH	mm	: -
XK	mm	: 18.8...20.8
XL	mm	: 9.9...13.3

Remarks:

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W66  
 Edition : 22.06.90  
 replaces : -  
 Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R387-1  
 Type number : 0 460 426 173

Customer-specific information  
 Customer : CUM

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 return temp. °C  
 with thermometer : 40...48  
 electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
 assembly : 1 688 901 027

Opening  
 pressure bar : 250...253

Perforated-plate  
 diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
 x Wall thickness : 2.0  
 x Length mm : 840.0

Start of delivery  
 Prestroke mm : 0.3  
 (from BDC): ±0.02(0.04)

Start of delivery block  
 Piston stroke mm: 1.6  
 mm: ±0.02(0.06)

Outlet : 0

Injection-pump setting values  
 Test specifications in parentheses

## Timing-device travel:

Speed 1/min: 1000  
 Charge press. hPa: 1000

Setting value mm: 1.8...2.2

## Supply-pump pressure:

Speed 1/min: 1000  
 Charge press. hPa: 1000  
 Setting value bar: 7.4...8.0

## Full-load del. with charge press.:

Speed 1/min: 900  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 67.5...68.5  
 Dispersion cm<sup>3</sup>/ : 4.0  
 1000H.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min : 600  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 56.0...57.0  
 Dispersion cm<sup>3</sup>/ : 9.0  
 1000H.: (9.0)

## Low-idle speed regulation:

Speed 1/min: 340  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 10.0...12.0  
 Dispersion cm<sup>3</sup>/ : 5.5  
 1000H.: (7.0)

## Full-load speed regulation:

Speed 1/min: 1170  
 Charge press. hPa: 1000  
 Del.quantity cm<sup>3</sup>/  
 1000H.: 44.5...50.5

## Start:

Speed 1/min: 100  
 Del.quantity : -  
 mind cm<sup>3</sup>/1000H.: 65.0

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 900  
 Charge press. hPa: 1000  
 TD travel mm: 0.7...1.5  
 mm: (0.4...1.8)

2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 TD travel mm: 1.8...2.2  
 mm: (1.3...2.7)

3rd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 2.4...3.2  
mm: (2.1...3.5)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.7...6.3  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.1...7.7  
3rd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.4...8.0  
4th speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.9...8.5

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del.quantity cm<sup>3</sup>/: 66.0...67.0  
1000H.: (62.5...70.5)  
2nd speed 1/min: 1280  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1230  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...15.0  
1000H.: -  
4th speed 1/min: 1200  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
5th speed 1/min: 1170  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 44.5...50.5  
1000H.: (41.5...53.5)  
6th speed 1/min: 1100  
Charge press. hPa: 1000

Del.quantity cm<sup>3</sup>/: 64.5...67.5  
1000H.: (63.0...69.0)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 67.5...68.5  
1000H.: (65.0...71.0)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 69.0...73.0  
1000H.: (67.0...75.0)  
9th speed 1/min: 700  
Charge press. hPa: 400  
Del.quantity cm<sup>3</sup>/: 66.0...67.0  
1000H.: (62.5...70.5)  
10th speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 56.0...57.0  
1000H.: (52.5...60.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 340  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 340  
Del.quantity cm<sup>3</sup>/: 10...12.0  
1000H.: (6.0...16.0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 70.0  
2nd speed 1/min: 480  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 70.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5.0...5.4
MS	mm	:	1.3...1.7
SVS max.	mm	:	1.0
XK	mm	:	21.8...23.8
XL	mm	:	10.2...13.6

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W63  
Edition : 20.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1300 R377-1  
Type number : 0 460 426 174  
  
Customer-specific information  
Customer : CUM  
  
Engine : 6BT 5.9 A

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
  
Opening  
pressure bar : 250...253  
  
Perforated-plate  
diameter mm : 0.5  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0  
  
Start of delivery  
Prestroke mm : 0.3  
(from BDC) :  $\pm 0.02(0.04)$   
  
Start of delivery block  
Piston stroke mm : 2.35  
mm :  $\pm 0.02(0.06)$   
  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850  
Charge press. hPa: 1000

Setting value mm: 2.6...3.0

Supply-pump pressure:

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value bar: 6.6...7.2

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 73.5...74.5  
Dispersion cm<sup>3</sup> / : 4.0  
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 50.5...51.5  
Dispersion cm<sup>3</sup> / : 9.0  
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 9.0...11.0  
Dispersion cm<sup>3</sup> / : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 54.0...60.0

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 60.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
Charge press. hPa: 1000  
TD travel mm: 1.4...2.2  
mm: (1.1...2.5)  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 2.6...3.0  
mm: (2.1...3.5)  
3rd speed 1/min: 1300



Charge press. hPa: 1000  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.8...5.4  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6.6...7.2  
3rd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump pressure bar: 8.6...9.2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 475  
Del.quantity cm<sup>3</sup>/: 63.0...64.0  
1000H.: (59.5...67.5)  
2nd speed 1/min: 1600  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1480  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 54.0...60.0  
1000H.: (51.0...63.0)  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 65.0...68.0  
1000H.: (63.5...69.5)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 69.5...72.5  
1000H.: (67.5...74.5)  
7th speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 73.5...74.5  
1000H.: (71.0...77.0)

8th speed 1/min: 700  
Charge press. hPa: 475  
Del.quantity cm<sup>3</sup>/: 63.0...64.0  
1000H.: (59.5...67.5)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 50.5...51.5  
1000H.: (47.0...55.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/: 9.0...11.0  
1000H.: (5.0...15.0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 250  
ind. 1000H: 50.0  
2nd speed 1/min: 400  
max. 1000H : 60.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
MS mm : 1.2...1.6  
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W64  
Edition : 20.06.90  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1400 R377-2  
Type number : 0 460 426 175

Customer-specific information  
Customer : CUM

Engine : 6BT 5.9 A

Power k: 107  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): +0.02(0.04)

Start of delivery block  
Piston stroke mm: 2.35  
mm: +0.02(0.06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.2...2.6

Supply-pump pressure:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value bar: 7.1...7.7

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 57.0...58.0  
Dispersion cm<sup>3</sup>/  
1000H.: 4.0  
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/  
1000H.: 44.5...45.5  
Dispersion cm<sup>3</sup>/  
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 6.5...10.5  
Dispersion cm<sup>3</sup>/  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1520  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/  
1000H.: 41.0...47.0

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 50.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 1.0...1.8  
mm: (0.7...2.1)

2nd speed 1/min: 1000  
Charge press. hPa: 1000

TD travel mm: 2.2...2.6  
mm: (1.7...3.1)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.7...5.3  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.1...7.7  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 8.9...9.5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 300  
Del.quantity cm<sup>3</sup>/: 50.0...51.0  
1000H.: (46.5...54.5)  
2nd speed 1/min: 1680  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1590  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1520  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 41.0...47.0  
1000H.: (38.0...50.0)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 57.5...61.5  
1000H.: (56.0...62.0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 58.0...61.0  
1000H.: (56.0...63.0)  
7th speed 1/min: 850

Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 57.0...58.0  
1000H.: (54.5...60.5)  
8th speed 1/min: 700  
Charge press. hPa: 300  
Del.quantity cm<sup>3</sup>/: 50.0...51.0  
1000H.: (46.5...54.5)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 44.5...45.5  
1000H.: (41.0...49.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0...3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 6.5...10.5  
1000H.: (3.5...13.5)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 230  
ind. 1000H: 65.0  
2nd speed 1/min: 400  
max. 1000H: 65.0

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
MS mm : 1.0...1.4  
SVS max. mm : 2.2

Remarks:

Operate control lever after each manifold-pressure compensator pressure

change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W65  
Edition : 20.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1400 R377-3  
Type number : 0 460 426 176

Customer-specific information  
Customer : CUM

Engine : 6BT 5.9 A

Power k: 114  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 0.35

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC): ±0.02(0.04)

Start of delivery block  
Piston stroke mm: 2.25  
mm: ±0.02(0.06)

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

E17

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 1.8...2.2

Supply-pump pressure:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value bar: 5.8...6.4

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 56.5...57.5  
Dispersion cm<sup>3</sup>/ : 4.0  
1000H.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 50.0...51.0  
Dispersion cm<sup>3</sup>/ : 9.0  
1000H.: (9.0)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 5.0...9.0  
Dispersion cm<sup>3</sup>/ : 5.5  
1000H.: (7.0)

Full-load speed regulation:

Speed 1/min: 1520  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 47.5...53.5

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 55.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: 0.5...1.3  
mm: (0.2...1.6)

2nd speed 1/min: 1000  
Charge press. hPa: 1000

TD travel mm: 1.8...2.2  
mm: (1.3...2.7)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 2.9...3.7  
mm: (2.6...4.0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.4...4.0  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5.8...6.4  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7.5...8.1

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del.quantity cm<sup>3</sup>/: 56.5...57.5  
1000H.: (53.0...61.0)  
2nd speed 1/min: 1700  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
3rd speed 1/min: 1600  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 15.0...55.0  
1000H.: -  
4th speed 1/min: 1520  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 47.5...53.5  
1000H.: (44.5...56.5)  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 60.0...63.0  
1000H.: (58.5...64.5)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 62.0...64.0  
1000H.: (60.0...67.0)  
7th speed 1/min: 850

Charge press. hPa: 1000  
Del.quantity cm<sup>3</sup>/: 61.5...62.5  
1000H.: (59.0...65.0)  
8th speed 1/min: 700  
Charge press. hPa: 350  
Del.quantity cm<sup>3</sup>/: 56.5...57.5  
1000H.: (53.0...61.0)  
9th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/: 50.0...51.0  
1000H.: (46.5...54.5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1400  
Del.quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 5.0...9.0  
1000H.: (2.0...12.0)  
2nd speed 1/min: 450  
Del.quantity cm<sup>3</sup>/: 0.0...4.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 270  
ind. 1000H: 65.0  
2nd speed 1/min: 400  
max. 1000H : 75.0

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm : -  
MS mm : 0.6...1.0  
SVS max. mm : 2.0

Remarks:

Operate control lever after each manifold-pressure compensator pressure

change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket





# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5.9 W56  
Edition : 19.06.90  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1050 R372-1  
Type number : 0 460 426 178

Customer-specific information  
Customer : CUM

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
pressure bar : 207...210

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 840.0

Start of delivery  
Prestroke mm : 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm : 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 2.4...2.8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 2.9...3.5

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/  
1000H.: 76.0...77.0  
Dispersion cm<sup>3</sup>/: 4.0  
1000H.: (4.5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 27.0...33.0  
Dispersion cm<sup>3</sup>/: 3.5  
1000H.: (4.5)

Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm<sup>3</sup>/  
1000H: 26.0...34.0

Start:

Speed 1/min: 100  
mind cm<sup>3</sup>/1000H.: 110.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0.9...1.7  
mm: (0.6...2.0)  
2nd speed 1/min: 750  
TD travel mm: 2.4...2.8  
mm: (1.9...2.3)  
3rd speed 1/min: 900  
TD travel mm: 3.5...4.3  
mm: (3.2...4.6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 1.9...2.5  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 2.9...3.5  
3rd speed 1/min: 900  
Supply-pump  
pressure bar: 3.5...4.1

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Overflow : 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1050  
 Overflow : 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
 Del.quantity cm<sup>3</sup>/: 0.0...3.0  
 1000H.: -  
 2nd speed 1/min: 1150  
 Del.quantity cm<sup>3</sup>/: 26.0...34.0  
 1000H.: (24.0...36.0)  
 3rd speed 1/min: 1050  
 Del.quantity cm<sup>3</sup>/: 72.0...75.0  
 1000H.: (70.5...76.5)  
 4th speed 1/min: 900  
 Del.quantity cm<sup>3</sup>/: 76.0...77.0  
 1000H.: (73.5...79.5)  
 5th speed 1/min: 750  
 Del.quantity cm<sup>3</sup>/: 78.5...82.5  
 1000H.: (76.5...84.5)  
 6th speed 1/min: 500  
 Del.quantity cm<sup>3</sup>/: 93.5...97.5  
 1000H.: (91.0...100.0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1050  
 Del.quantity cm<sup>3</sup>/: 0..3  
 1000H.: -

Electr. shutoff:

Speed 1/min: 375  
 ELAB volt: -  
 Del.quantity cm<sup>3</sup>/: 0.0...3.0  
 max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
 1st speed 1/min: 375  
 Del.quantity cm<sup>3</sup>/: 27...33.0  
 1000H.: (25...35.0)  
 2nd speed 1/min: 450  
 Del.quantity cm<sup>3</sup>/: 0.0...4.0  
 1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
 ind. 1000H: 110.0

2nd speed 1/min: 200  
 max. 1000H : 105.0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5.0...5.4
MS	mm	: 1.3...1.7
XK	mm	: 18.8...20.8
XL	mm	: 11.1...14.5

Remarks:

Heavy-duty fuel-injection pump for  
 DI-engines: only test using timing-  
 device-travel measuring device with  
 metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1.5 C  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2500 R305  
Type number : 9 460 620 002  
Customer Part-No. : 8 944 60 8050

Customer-specific information  
Customer : OPE

Engine : 4EC1-AADT

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...52

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 450.0

Start of delivery  
Prestroke mm : -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value mm: 2.8...3.2

Supply-pump pressure:

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value bar: 3.8...4.4

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 700  
Del. quantity cm<sup>3</sup>/  
1000H.: 43.6...44.6  
Dispersion cm<sup>3</sup>/ : -  
1000H.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min : 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 33.0...37.0

Low-idle speed regulation:

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000H.: 6.9...10.9  
Dispersion cm<sup>3</sup>/: 2.5  
1000H.: (3.0)

Full-load speed regulation:

Speed 1/min: 2750  
Charge press. hPa: 700  
Del. quantity cm<sup>3</sup>/  
1000H.: 16.9...22.9

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 44.0

Load-dependent start of delivery:

Speed 1/min: 1250  
Charge press. hPa: 700

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620  
Charge press. hPa: 700  
TD travel mm: 0.3...1.1  
mm: (0.0...1.4)

2nd speed 1/min: 1250  
Charge press. hPa: 700  
TD travel mm: 2.8...3.2  
mm: (2.3...3.7)

3rd speed 1/min: 2000

Charge press. hPa: 700  
TD travel mm: 5.6...6.4  
mm: (5.3...6.7)  
4th speed 1/min: 2250  
Charge press. hPa: 700  
TD travel mm: 6.6...7.4  
mm: (6.3...7.7)

Supply-pump pressure characteristic:

1st speed 1/min: 620  
Charge press. hPa: 700  
Supply-pump pressure bar: 2.2...2.8  
2nd speed 1/min: 1250  
Charge press. hPa: 700  
Supply-pump pressure bar: 3.8...4.4  
3rd speed 1/min: 2250  
Charge press. hPa: 700  
Supply-pump pressure bar: 6.2...6.8

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
26...98  
2nd speed 1/min: 2500  
Charge press. hPa: 700  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
40...153

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting point hPa: 340  
Del.quantity cm<sup>3</sup>/: 39.8...40.8  
1000H.: (37.8...42.8)  
2nd speed 1/min: 2750  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 16.9...22.9  
1000H.: (15.9...23.9)  
3rd speed 1/min: 2750  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -  
4th speed 1/min: 2600  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 26.1...34.1  
1000H.: -  
5th speed 1/min: 2500  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 37.0...40.0  
1000H.: (36.2...40.8)  
6th speed 1/min: 2300  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 40.4...43.4  
1000H.: (39.7...44.1)

7th speed 1/min: 2000  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 40.5...43.5  
1000H.: (40.0...44.0)  
8th speed 1/min: 1500  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 43.6...44.6  
1000H.: (41.8...46.4)  
9th speed 1/min: 1500  
Del.quantity cm<sup>3</sup>/: 30.4...34.4  
1000H.: (29.9...34.9)  
10th speed 1/min: 1300  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 44.1...47.1  
1000H.: (43.6...47.6)  
11th speed 1/min: 1000  
Charge press. hPa: 340  
Del.quantity cm<sup>3</sup>/: 39.8...40.8  
1000H.: (37.8...42.8)  
1st speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 33.0...37.0  
1000H.: (32.0...38.0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425  
Del.quantity cm<sup>3</sup>/: 6.9...10.9  
1000H.: (4.9...12.9)  
2nd speed 1/min: 550  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H.: 44.0  
2nd speed 1/min: 400  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H.: 42.5

Shutoff electromagnet:

Cut-in min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	-
SVS max.	mm	:	-

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 1.5 D  
Edition : 22.06.90  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2500 R341  
Type number : 9 460 620 003  
Customer Part-No. : 8 943 32 9740

Customer-specific information  
Customer : OPE

Engine : 4EC1-BADT

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.0  
x Wall thickness : 2.0  
x Length mm : 450.0

Start of delivery  
Prestroke mm : -  
(from BDC): -

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value mm: 2.8...3.2

Supply-pump pressure:

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value bar: 3.8...4.4

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/  
1000H.: 46.9...47.9  
Dispersion cm<sup>3</sup> / : -  
1000H.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min : 600  
Del.quantity cm<sup>3</sup>/  
1000H.: 33.8...37.8

Low-idle speed regulation:

Speed 1/min: 425  
Del.quantity cm<sup>3</sup>/  
1000H.: 6.9...10.9  
Dispersion cm<sup>3</sup> / : 2.5  
1000H.: (3.0)

Full-load speed regulation:

Speed 1/min: 2750  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/  
1000H: 19.6...25.6

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 38.0

Load-dependent start of delivery:

Speed 1/min: 1250  
Charge press. hPa: 700

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620  
Charge press. hPa: 700  
TD travel mm: 0.3...1.1  
mm: (0.0...1.4)  
2nd speed 1/min: 1250  
Charge press. hPa: 700  
TD travel mm: 2.8...3.2  
mm: (2.3...3.7)  
3rd speed 1/min: 2000

Charge press. hPa: 700  
TD travel mm: 5.6...6.4  
mm: (5.3...6.7)  
4th speed 1/min: 2250  
Charge press. hPa: 700  
TD travel mm: 6.6...7.4  
mm: (6.3...7.7)

Supply-pump pressure characteristic:

1st speed 1/min: 620  
Charge press. hPa: 700  
Supply-pump pressure bar: 2.2...2.8  
2nd speed 1/min: 1250  
Charge press. hPa: 700  
Supply-pump pressure bar: 3.8...4.4  
3rd speed 1/min: 2250  
Charge press. hPa: 700  
Supply-pump pressure bar: 6.2...6.8

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2500  
Charge press. hPa: 700  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting point hPa: 340  
Del.quantity cm<sup>3</sup>/: 43.3...44.3  
1000H.: (41.3...46.3)  
2nd speed 1/min: 2950  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 0.0...15.0  
1000H.: -  
3rd speed 1/min: 2750  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 19.6...25.6  
1000H.: (18.6...26.6)  
4th speed 1/min: 2600  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 26.1...34.1  
1000H.: -  
5th speed 1/min: 2500  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 34.1...37.1  
1000H.: (33.3...37.9)  
6th speed 1/min: 2300  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 44.5...47.5  
1000H.: (43.8...48.2)

7th speed 1/min: 2000  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 44.3...47.3  
1000H.: (43.8...47.8)  
8th speed 1/min: 1500  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 46.9...47.9  
1000H.: (45.1...49.7)  
9th speed 1/min: 1500  
Del.quantity cm<sup>3</sup>/: 34.6...38.6  
1000H.: (34.1...39.1)  
10th speed 1/min: 1300  
Charge press. hPa: 700  
Del.quantity cm<sup>3</sup>/: 46.1...49.1  
1000H.: (45.6...49.6)  
11th speed 1/min: 1000  
Charge press. hPa: 340  
Del.quantity cm<sup>3</sup>/: 43.3...44.5  
1000H.: (41.3...46.5)  
1st speed 1/min: 600  
Del.quantity cm<sup>3</sup>/: 33.8...37.8  
1000H.: (32.8...38.8)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 0.0...3.0  
max. 1000H.: -

Idle delivery:

1st speed 1/min: 425  
Del.quantity cm<sup>3</sup>/: 6.9...10.9  
1000H.: (4.9...12.9)  
2nd speed 1/min: 550  
Del.quantity cm<sup>3</sup>/: 0.0...5.0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 100  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 38.0

2nd speed 1/min: 400  
Del.quantity cm<sup>3</sup>/: -  
max. 1000H : 57.5

Shutoff electromagnet:

Cut-in  
min. voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	-
MS	mm	:	-
SVS max.	mm	:	-

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 3,0 b 2  
 Edition : 02.05.90  
 Replaces : 15.8.89  
 Test oil : ISO-4113

Combination no. : 0 400 473 088

Injection pump  
 Pump designation : PES3A80D410RS1324-2  
 EP type number : 0 410 483 025  
 Governor  
 Governor design. : RSV325...900A7C602-1  
 L  
 Governor no. : 0 420 232 388

Customer-spec. information  
 Customer : KHD

Engine : F3L912

1st version kw : 60.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 2

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 880

Rack travel in mm : 11.60...11.70

Del.quantity cm<sup>3</sup>/ : 4.6...4.7

100 s: (4.5...4.9)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 8.9...9.1

Del.quantity cm<sup>3</sup>/ : 0.7...1.3

100 s: (0.5...1.4)

Spread cm<sup>3</sup> : 0.2

100 s: (0.3)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 880

Del.quantity : 46.5...47.5

1000 : (45.0...49.0)

Spread cm<sup>3</sup> : 2.50

1000 : (4.00)

RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 10.60

Speed rpm : 920...930

2nd rack travel in: 4.00

Speed rpm : 935...965  
3rd rack travel in: 4.00  
Speed rpm : 955...985  
4th rack travel in: 1145  
Speed rpm : 0.30...1.40

Generator set

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.90...7.10  
Rack travel in mm : 2.00  
Speed rpm : 475...535

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 880  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 500  
Rack travel in m: 13.00...13.10  
3rd speed rpm : 700  
Rack travel in m: 12.20...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 49.5...51.5  
1000 s: (47.5...53.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 920...930

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...125.0  
1000 s: (112.0...128.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 19,0 n4  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 640 115  
 Injection pump  
 Pump designation : PE12A95D610LS2590  
 EP type number : 0 410 690 995  
 Governor  
 Governor design. : RQV300...1000AB1047-  
 1L  
 Governor no. : 0 420 212 223

Customer-spec. information  
 Customer : KHD

Engine : F12L413FW

1st version kW : 182.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 4- 9- 8- 5- 2-  
 11- 10- 3- 6- 7- 12

Phasing : 0-15-60-75-120-135-  
 180-195-240-255-300-  
 315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 10.00...10.10  
 Del.quantity cm<sup>3</sup>/ : 7.9...8.1  
 100 s: (7.7...8.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.20...1.30  
 2nd speed rpm : 340  
 travel mm : 1.80...1.90  
 3rd speed rpm : 390  
 travel mm : 2.40...2.50  
 4th speed rpm : 1050  
 travel mm : 8.70...8.90  
 5th speed rpm : 1110  
 travel mm : 9.50...9.70

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1015  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del.quantity : 79.0...81.0  
 1000 : (77.0...83.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 9.00  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 800  
Rack travel in m: 10.40...10.50  
3rd speed rpm : 900  
Rack travel in m: 10.20...10.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...70.0  
1000 s: (62.5...72.5)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 82.5...85.5  
1000 s: (80.0...88.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.00

Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

2. Set fuel delivery in fuel-delivery  
characteristics with stop above the  
governor housing.

When accelerating from engine speed  
"0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MB 8,7 c 1  
 Edition : 20.07.90  
 Replaces : 7.85  
 Test oil : ISO-4113  
 Combination no. : 0 400 646 248  
 Injection pump  
 Pump designation : PE6A90D410RS2124X  
 EP type number : 0 410 696 155  
 Governor  
 Governor design. : RQ375/1275AB658DL  
 Governor no. : 0 420 202 282

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 360

1st version kW : 125.0  
 Rated speed : 2550

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250

Rack travel in mm : 9.30...9.40

Del.quantity cm<sup>3</sup>/ : 7.7...7.8

100 s: (7.5...8.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.4)

2nd speed rpm : 375.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 700

Rack travel in mm : 15.60...16.40

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1250

Del.quantity : 77.0...78.0

1000 : (75.0...80.0)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

**RATED SPEED**

1st version

Setting point:

Speed rpm : 700

Rack travel in mm : 16.0

Testing:

1st rack travel in: 8.30

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1345...1375

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 375

Rack travel in mm : 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.50

Speed rpm : 375

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 420...460

Speed rpm : 500

Maximum rack trave: 1.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 9.30...9.40

2nd speed rpm : 700

Rack travel in m: 10.10...10.20

3rd speed rpm : 895

Rack travel in m: 9.80...10.00

4th speed rpm : 1075

Rack travel in m: 9.40...9.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 77.0...80.0

1000 s: (75.0...82.0)

RACK STOP ADJUSTMENT

Speed rpm : 650

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.30

Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 15.20...17.80

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : KHD 9,6 n 1  
 Edition : 06.07.90  
 Replaces : 5.2.88  
 Test oil : ISO-4113

Combination no. : 0 400 646 266

Injection pump  
 Pump designation : PE6A95D410LS2587  
 EP type number : 0 410 696 983  
 Governor  
 Governor design. : RQV300...1150AB1088L  
 Governor no. : 0 420 212 115

Customer-spec. information  
 Customer : KHD

Engine : F6L413 FW

1st version kW : 102.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00

F06

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1150

Rack travel in mm : 9.60...9.70

Del.quantity cm<sup>3</sup>/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 300  
 travel mm : 1.10...1.60

2nd speed rpm : 390  
 travel mm : 2.20...2.60

3rd speed rpm : 1195  
 travel mm : 8.70...9.10

4th speed rpm : 1245  
 travel mm : 9.40...9.80

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1150  
 Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 8.60  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 67...75

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.40  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 300...420

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.50  
3rd speed rpm : 925  
Rack travel in m: 10.10...10.30  
4th speed rpm : 1030  
Rack travel in m: 9.60...9.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...70.0  
1000 s: (62.5...72.5)  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 80.5...83.5  
1000 s: (78.0...86.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

F07

1st version  
1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 15.40...15.80

Remarks:  
:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

2. Set fuel delivery in fuel-delivery  
characteristics with stop above the  
governor housing.

When accelerating from engine speed  
"0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,3 k 2  
 Edition : 21.05.90  
 Replaces : 15.12.89  
 Test oil : ISO-4113

Combination no. : 0 400 646 268

Injection pump  
 Pump designation : PE6A95D410RS2525  
 EP type number : 0 410 696 987  
 Governor  
 Governor design. : RQ225/1200AB1156L  
 Governor no. : 0 420 200 079

Customer-spec. information  
 Customer : DAF

Engine : DH 825

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 7.3...7.4

100 s: (7.1...7.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 225.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 73.5...74.5

1000 : (71.5...76.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.40

Speed rpm : 1245...1260

2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 225  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385  
Speed rpm : 490  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 650  
Rack travel in m: 11.70...11.80  
4th speed rpm : 1035  
Rack travel in m: 10.90...11.10  
5th speed rpm : 1100  
Rack travel in m: 10.50...10.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm3/ : 74.5...77.5  
1000 s: (72.0...80.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p5  
 Edition : 17.05.90  
 Replaces : 28.4.89  
 Test oil : ISO-4113

Combination no. : 0 400 648 111

Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQ300/1250AB987DL  
 Governor no. : 0 420 202 277

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 188.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

F10

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 9.6...9.8  
 100 s : (9.4...10.0)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.5...6.7  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s : (0.6...1.7)

Spread cm<sup>3</sup> : 0.5  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550  
 Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del. quantity : 96.5...98.5  
 1000 : (94.5...100.5)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 16.0

Testing:  
 1st rack travel in: 9.40  
 Speed rpm : 1295...1310  
 2nd rack travel in: 4.00  
 Speed rpm : 1335...1365

4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack trave: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 345...385  
Speed rpm : 550  
Maximum rack trave: 1.00

TORQUE CONTROL

Dimension a mm : 0.25  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 550  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.60...10.80  
4th speed rpm : 970  
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 95.0...98.0  
1000 s: (92.5...100.5)

RACK STOP ADJUSTMENT

Speed rpm : 600

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...140.0  
1000 s: (122.0...143.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

F11

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 5.50  
1000 s: (7.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 12,7 p7
Edition : 11.05.89
Replaces : -
Test oil : ISO-4113
Combination no. : 0 400 648 112
Injection pump
Pump designation : PE8A95D41DLS2608
EP type number : 0 410 698 988
Governor
Governor design. : RQV300...1250AB990DL
Governor no. : 0 420 214 228

Customer-spec. information
Customer : KHD

Engine : F8L413F

1st version kw : 188.0
Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
: (1.95...2.15)
Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-
4- 3

Phasing : 0-45-90-135-180-225-
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 9.1...9.3

100 s: (8.9...9.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0
Rack travel in mm : 6.2...6.3
Del.quantity cm3/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1290

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 91.5...93.5

1000 : (89.5...95.5)

Spread cm3 : 3.00

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 57...65

Setting point:

Speed rpm : 1290

Rack travel in mm : 16.5

Testing:

1st rack travel in: 8.90

Speed rpm : 1290...1300

2nd rack travel in: 4.00  
Speed rpm : 1360...1390  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.20...6.30  
Speed rpm : 950  
Maximum rack trave: 1.00

CONSTANT REGULATION  
Speed rpm : 320...440

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.90...10.00  
2nd speed rpm : 1075  
Rack travel in m: 9.90...10.20  
3rd speed rpm : 925  
Rack travel in m: 10.20...10.40  
4th speed rpm : 500  
Rack travel in m: 10.40...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 91.0...94.0  
1000 s: (89.0...96.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 91.5...94.5  
1000 s: (89.5...96.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 600

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8.90

Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 13.90...14.90

Remarks:  
:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 12,7 p9  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 648 139  
 Injection pump  
 Pump designation : PE8A95D410LS2608  
 EP type number : 0 410 698 988  
 Governor  
 Governor design. : RQV450...1150AB1194L  
 Governor no. : 0 420 212 171

Customer-spec. information  
 Customer : KHD

Engine : F8L413F

1st version kW : 157.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
 4- 3

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900  
 Rack travel in mm : 10.30...10.40  
 Del.quantity cm<sup>3</sup>/ : 9.3...9.5  
 100 s: (9.1...9.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 450.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 400  
 travel mm : 0.30...0.60  
 2nd speed rpm : 750  
 travel mm : 3.50...3.80  
 3rd speed rpm : 1050  
 travel mm : 6.70...6.90  
 4th speed rpm : 1200  
 travel mm : 8.90...9.40

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed rpm : 1150  
 Rack travel in mm : 15.20...17.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 900  
 Del.quantity : 93.5...95.5  
 1000 : (91.5...97.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 60...68

Testing:  
1st rack travel in: 7.30  
Speed rpm : 1170...1180  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 6...14  
Speed rpm : 450  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 510...670

TORQUE CONTROL  
Dimension a mm : 1.00  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 500  
Rack travel in m: 10.30...10.40  
3rd speed rpm : 995  
Rack travel in m: 10.00...10.20  
4th speed rpm : 1080  
Rack travel in m: 9.50...9.70

START CUT-OUT  
Speed 1/min : 370 (390)

BREAKAWAY  
1st version  
1mm rack travel less than  
full load rack tr: 7.30  
Speed rpm : 1170...1180

STARTING FUEL DELIVERY  
Speed rpm : 100  
Del.quantity cm3/ : 116.5...126.5  
1000 s: (113.5...129.5)

Remarks:  
:

APPLICATION



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DAF 6,2 i 1  
 Edition : 29.05.90  
 Replaces : 18.12.87  
 Test oil : ISO-4113

Combination no. : 0 400 676 141

Injection pump  
 Pump designation : PE6A90D32ORS2547  
 EP type number : 0 410 696 180  
 Governor  
 Governor design. : RSV250...1200A5B779R  
 Governor no. : 0 420 233 121

Customer-spec. information  
 Customer : DAF

Engine : DT615

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

**BASIC SETTING**

1st speed rpm : 1000

---

Rack travel in mm : 10.80...10.90

---

Del.quantity cm<sup>3</sup>/ : 7.1...7.2

---

100 s: (6.9...7.4)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.4)

---

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 700  
 Del.quantity : 71.0...72.0

1000 : (69.0...74.0)

Spread cm<sup>3</sup> : 3.00

1000 : (4.50)

**RATED SPEED**

1st version  
 Control Lever  
 position degrees: 97...105

Testing:

1st rack travel in: 9.80  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
3rd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 330...390

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 400  
Rack travel in m: 11.30...11.40  
3rd speed rpm : 300  
Rack travel in m: 11.50...12.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 1000  
Pressure hPa : 700  
Rack travel mm : 10.80...10.90

#### Measurement

Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 250  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 210  
Rack travel in m: 10.10...10.40

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 52.0...53.0  
1000 s: (50.0...55.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...150.0  
1000 s: (137.0...153.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

#### Remarks:

Cold-start testing of RSV governor  
according to VDT-I-420/114.

#### APPLICATION

Special-purpose vehicle



according to VDT-I-420/114.

1st rack travel in: 9.40  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
3rd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1505  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.7  
Speed rpm : 250  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 655...715

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.30  
3rd speed rpm : 800  
Rack travel in m: 11.10...11.20  
4th speed rpm : 940  
Rack travel in m: 10.70...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 74.5...77.5  
1000 s: (72.0...80.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...140.0  
1000 s: (122.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

Cold-start testing of RSV governor

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 8,3 n 7  
 Edition : 21.05.90  
 Replaces : 30.9.88  
 Test oil : ISO-4113  
  
 Combination no. : 0 400 676 178  
  
 Injection pump  
 Pump designation : PE6A95D410RS2575  
 EP type number : 0 410 696 984  
 Governor  
 Governor design. : RSV250...750A7C22D1L  
 Governor no. : 0 420 232 444

Customer-spec. information  
 Customer : DAF

Engine : DHTD 825

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 417 413 000  
  
 Inlet press., bar : 1.50  
  
 Test nozzle holder  
 assembly : 0 681 343 009  
  
 Opening  
 pressure, bar : 172...175  
  
 Test Lines : 1 680 750 015  
  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 7.50...10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 700  


---

 Rack travel in mm : 13.20...13.30  


---

 Del. quantity cm<sup>3</sup>/ : 11.0...11.1  
 100 s: (10.8...11.3)  


---

 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.0...6.2  
 Del. quantity cm<sup>3</sup>/ : 0.7...1.3  
 100 s: (0.5...1.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 110.5...111.5  
 1000 : (108.5...113.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 90...98

Testing:  
 1st rack travel in: 12.20  
 Speed rpm : 750...755  
 2nd rack travel in: 4.00  
 Speed rpm : 780...795

4th rack travel in: 950  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.1

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 250  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 255...315

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 7.0...13.0  
1000 s: (5.5...14.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

#### APPLICATION

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DAF 6,2 n 3  
 Edition : 29.05.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 400 676 179

Injection pump  
 Pump designation : PE6A90D32ORS2577  
 EP type number : 0 410 696 181  
 Governor  
 Governor design. : RSV250...750A7C2202R  
 Governor no. : 0 420 233 202

**Customer-spec. information**

Customer : DAF

Engine : DT 615

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

**BASIC SETTING**

1st speed rpm : 700

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm<sup>3</sup>/ : 7.4...7.5

---

100 s: (7.2...7.7)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.5)

---

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 700

Del.quantity : 74.5...75.5

1000 : (72.5...77.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 90...98

Testing:  
 1st rack travel in: 10.00

Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...795  
4th rack travel in: 950  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 280...340

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 8.0...14.0  
1000 s: (6.0...16.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 m 3  
 Edition : 29.05.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 400 676 181

Injection pump  
 Pump designation : PE6A85D320RS2546  
 EP type number : 0 410 686 943  
 Governor  
 Governor design. : RSV250...750A7C2202R  
 Governor no. : 0 420 233 202

Customer-spec. information

Customer : DAF

Engine : DF615

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm3/ : 6.6...6.7

---

100 s: (6.4...6.9)

---

Spread cm3 : 0.3

---

100 s: (0.5)

---

2nd speed rpm : 250.0

Rack travel in mm : 8.4...8.6

Del.quantity cm3/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 66.5...67.5

1000 : (64.5...69.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 90...98

Testing:  
 1st rack travel in: 11.10

Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...795  
4th rack travel in: 950  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 73...82  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 8.5  
Speed rpm : 250  
Rack travel in mm : 8.40...8.60  
Rack travel in mm : 2.00  
Speed rpm : 295...355

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 8.40...8.60  
Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (7.0...17.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 i 6  
 Edition : 29.05.90  
 Replaces : 9.3.87  
 Test oil : ISO-4113

Combination no. : 0 400 676 182

Injection pump  
 Pump designation : PE6A90D410RS2524  
 EP type number : 0 410 696 179  
 Governor  
 Governor design. : RSV250...750A7C2201L  
 Governor no. : 0 420 232 444

Customer-spec. information  
 Customer : DAF

Engine : DH 825

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.30...2.40  
 : (2.25...2.45)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.50...5.50

BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 9.70...9.80

---

Del. quantity cm<sup>3</sup>/ : 8.3...8.4

---

100 s: (8.1...8.6)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.5)

---

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.5

Del. quantity cm<sup>3</sup>/ : 1.9...2.5

100 s: (1.7...2.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del. quantity : 83.0...84.0  
 1000 : (81.0...86.0)

Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 90...98

Testing:  
 1st rack travel in: 8.70

Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...795  
4th rack travel in: 950  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.4  
Speed rpm : 250  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 295...355

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (17.0...27.0)  
Spread cm<sup>3</sup> : 2.50  
1000 s: (4.50)

Remarks:

:

APPLICATION

Generator

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 b10  
 Edition : 08.06.90  
 Replaces : 1.2.90  
 Test oil : ISO-4113

Combination no. : 0 400 836 043

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -2  
 EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1200AB1245R  
 Governor no. : 0 420 213 118

**Customer-spec. information**

Customer : C.D.C

Engine : 6CT830

1st version kW : 157.0  
 Rated speed : 2400

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 11.3...11.5

100 s: (11.1...11.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...4.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 250

travel mm : 0.00...0.20

2nd speed rpm : 350

travel mm : 1.00...1.50

3rd speed rpm : 450

travel mm : 1.90...2.40

4th speed rpm : 1200

travel mm : 6.90...6.90

5th speed rpm : 1350

travel mm : 8.15...8.65

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 1200

Del.quantity : 113.0...115.0

1000 : (111.0...117.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

**RATED SPEED**

1st version  
Control lever  
position degrees: 42...50

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90

#### START CUT-OUT

Speed 1/min : 290 (300)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:  
: C.D.C. # 3917098

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 8,0 o 1  
 Edition : 06.07.90  
 Replaces : 10.85  
 Test oil : ISO-4113  
 Combination no. : 0 400 845 082  
 Injection pump  
 Pump designation : PES5A95D410RS2680  
 EP type number : 0 410 895 972  
 Governor  
 Governor design. : RQV300...1150AB1217L  
 Governor no. : 0 420 212 186

Customer-spec. information  
 Customer : KHD

Engine : F5L413FFRW

1st version kW : 85.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)  
 Rack travel in mm : 9.00...12.00

G02

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.30...8.40

Del.quantity cm<sup>3</sup>/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 7.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 320...415

TORQUE CONTROL  
Dimension a mm : 1.40  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.30...8.40  
2nd speed rpm : 500  
Rack travel in m: 9.70...9.80  
3rd speed rpm : 840  
Rack travel in m: 9.30...9.50  
4th speed rpm : 1010  
Rack travel in m: 8.60...8.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 80.5...83.5  
1000 s: (78.0...86.0)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...70.0  
1000 s: (62.5...72.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 7.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.30...14.70

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

When accelerating from engine speed "0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 a  
Edition : 06.07.90  
Replaces : 11.7.88  
Test oil : ISO-4113

Combination no. : 0 400 846 522

Injection pump  
Pump designation : PES6A90D410RS2667  
EP type number : 0 410 896 080  
Governor  
Governor design. : RQV300...1400AB1065-4L  
Governor no. : 0 420 212 168

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 100.0  
Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400

---

Rack travel in mm : 11.10...11.20

---

Del. quantity cm<sup>3</sup>/ : 6.3...6.4  
100 s : (6.1...6.6)

---

Spread cm<sup>3</sup> : 0.3  
100 s : (0.4)

---

2nd speed rpm : 300.0  
Rack travel in mm : 8.9...9.1  
Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
100 s : (0.7...1.5)

Spread cm<sup>3</sup> : 0.2  
100 s : (0.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.80...1.30

2nd speed rpm : 500  
travel mm : 2.30...2.80

3rd speed rpm : 750  
travel mm : 4.10...4.30

4th speed rpm : 1500  
travel mm : 8.50...8.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1400  
Del. quantity : 63.5...64.5  
1000 : (61.5...66.5)

Spread cm<sup>3</sup> : 3.00  
1000 : (4.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 10.10

Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1540...1570  
4th rack travel in: 1650  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.30  
Speed rpm : 300  
Rack travel in mm : 8.90...9.10

CONSTANT REGULATION  
Speed rpm : 540...680

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 500  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 900  
Rack travel in m: 11.80...12.10  
4th speed rpm : 1100  
Rack travel in m: 11.40...11.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 52.0...54.0  
1000 s: (49.5...56.5)  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 55.0...58.0  
1000 s: (52.5...60.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1440...1450

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

Rack travel in mm : 17.00...17.40

Remarks:

:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : DAF 6,2 o 2  
 Edition : 19.03.90  
 Replaces : 12.1.90  
 Test oil : ISO-4113

Combination no. : 0 400 846 538

Injection pump  
 Pump designation : PES6A95D32DRS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RQ300/1300AB1204R  
 Governer no. : 0 420 201 640

Customer-spec. information  
 Customer : DAF

Engine : DNT 620

1st version kw : 130.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00x1.50x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 7.50...10.50

G06

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 7.6...7.8

100 s: (7.4...8.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 800

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 76.0...78.0

1000 : (74.0...80.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

**1st version**

Setting point:

Speed rpm : 800

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.70  
Speed rpm : 1350...1365  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:

Speed rpm : 100  
Minimum rack trave: 7.30  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

TORQUE CONTROL

Dimension a mm : 0.55  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 850  
Rack travel in m: 12.00...12.40  
3rd speed rpm : 935  
Rack travel in m: 11.50...11.90  
4th speed rpm : 1080  
Rack travel in m: 10.80...11.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 250  
Rack travel in m: 11.40...11.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 1290

Del.quantity cm3/ : 74.0...76.0  
1000 s: (71.5...78.5)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 65.0...67.0  
1000 s: (63.0...69.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1350...1365

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 6,2 p  
 Edition : 29.05.90  
 Replaces : 14.7.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 539  
 Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RQ300/1300AB1205R  
 Governor no. : 0 420 201 642

Customer-spec. information  
 Customer : DAF

Engine : DNTD 620

1st version kw : 110.0  
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 6.4...6.5

100 s: (6.2...6.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.7...6.9

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 800

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del.quantity : 64.5...65.5

1000 : (62.5...67.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 800

Rack travel in mm : 20.0

Testing:  
1st rack travel in: 9.30  
Speed rpm : 1335...1350  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

Testing:  
Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 550...590

TORQUE CONTROL  
Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 850  
Rack travel in m: 11.10...11.50  
3rd speed rpm : 970  
Rack travel in m: 10.80...11.20  
4th speed rpm : 1050  
Rack travel in m: 10.50...10.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 1290  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (66.5...73.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1335...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...145.0  
1000 s: (127.0...148.0)

Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 s  
 Edition : 17.05.90  
 Replaces : 12.9.86  
 Test oil : ISO-4113

Combination no. : 0 400 846 544

Injection pump  
 Pump designation : PES6A95D410RS2416  
 EP type number : 0 410 896 961  
 Governor  
 Governor design. : RQV300...1250AB1211L  
 Governor no. : 0 420 212 184

Customer-spec. information  
 Customer : KHD

Engine : F6L413FR

1st version kw : 123.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250

---

Rack travel in mm : 10.00...10.10

---

Del.quantity cm<sup>3</sup>/ : 9.9...10.1  
 100 s : (9.7...10.3)

---

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 6.4...6.6  
 Del.quantity cm<sup>3</sup>/ : 1.9...2.5  
 100 s : (1.6...2.7)

---

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.20  
 2nd speed rpm : 500  
 travel mm : 3.20...3.50  
 3rd speed rpm : 1000  
 travel mm : 6.20...6.40  
 4th speed rpm : 1250  
 travel mm : 8.20...8.30

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1280  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 99.0...101.0  
 1000 : (97.0...103.0)

---

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:  
1st rack travel in: 9.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1350...1380  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 84...92

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 370...485

TORQUE CONTROL  
Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 600  
Rack travel in m: 10.20...10.30  
3rd speed rpm : 715  
Rack travel in m: 10.10...10.30  
4th speed rpm : 765  
Rack travel in m: 10.00...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 91.5...94.5  
1000 s: (89.0...97.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.00  
Speed rpm : 1290...1300

INTERMEDIATE RATED SPEED  
Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 19.0...25.0  
1000 s: (16.5...27.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

#### APPLICATION

Special-purpose vehicle



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 9,6 m 1  
 Edition : 06.07.90  
 Replaces : 8.9.89  
 Test oil : ISO-4113

Combination no. : 0 400 846 545

Injection pump  
 Pump designation : PES6A95D410RS2681  
 EP type number : 0 410 896 918  
 Governor  
 Governor design. : RQV300...1150AB1217L  
 Governor no. : 0 420 212 186

Customer-spec. information  
 Customer : KHD

Engine : F6L413FRW

1st version kW : 102.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.30...8.40

Del.quantity cm<sup>3</sup>/ : 7.2...7.4

100 s: (7.0...7.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 72.0...74.0

1000 : (70.0...76.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 7.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 320...415

TORQUE CONTROL  
Dimension a mm : 1.40  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.30...8.40  
2nd speed rpm : 500  
Rack travel in m: 9.70...9.80  
3rd speed rpm : 840  
Rack travel in m: 9.30...9.50  
4th speed rpm : 1010  
Rack travel in m: 8.60...8.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 80.5...83.5  
1000 s: (78.0...86.0)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...70.0  
1000 s: (62.5...72.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 7.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
Rack travel in mm : 14.40...14.80

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

2. Set fuel delivery in fuel-delivery  
characteristics with stop above the  
governor housing.

When accelerating from engine speed  
"0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 b 1  
 Edition : 10.08.90  
 Replaces : 25.8.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 562  
 Injection pump  
 Pump designation : PES6A100D410RS2687  
 EP type number : 0 410 806 001  
 Governor  
 Governor design. : RQV400...1000AB1231L  
 Governor no. : 0 420 212 206

Customer-spec. information  
 Customer : LIEBHERR

Engine : D906TI

1st version kW : 169.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test Lines : 1 680 750 008  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 13.70...13.80  
 Del. quantity cm<sup>3</sup>/ : 13.9...14.1  
 100 s: (13.7...14.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 6.8...7.0  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 440  
 travel mm : 2.10...2.30  
 2nd speed rpm : 500  
 travel mm : 3.00...3.50  
 3rd speed rpm : 585  
 travel mm : 3.50...4.00  
 4th speed rpm : 1045  
 travel mm : 8.10...8.20  
 5th speed rpm : 1135  
 travel mm : 9.40...9.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1065  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000

Aneroid pressure h: 700  
Del. quantity : 139.0...141.0  
1000 : (137.0...143.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.70  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.30  
Speed rpm : 400  
Rack travel in mm : 6.80...7.00

CONSTANT REGULATION  
Speed rpm : 425...500

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 13.70...13.80  
2nd speed rpm : 500  
Rack travel in m: 13.70...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.70...13.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 435  
Rack travel in m: 13.30...13.40  
3rd pressure hPa : 410  
Rack travel in m: 12.80...13.00

#### START CUT-OUT

Speed 1/min : 320 (340)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 700  
Del. quantity cm3/ : 134.0...136.0  
1000 s: (131.5...138.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 104.5...106.5  
1000 s: (102.5...108.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 105.0...115.0  
1000 s: (102.0...118.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.80...7.00  
Del. quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : RAB 9,7 b 2  
 Edition : 31.07.90  
 Replaces : 9.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 576  
 Injection pump  
 Pump designation : PES6A95D420LS2595  
 EP type number : 0 410 896 930  
 Governor  
 Governor design. : RQ200/1050AB1246R  
 Governor no. : 0 420 201 647

Customer-spec. information  
 Customer : RABA

Engine : D2156 MT6U

1st version kW : 154.0  
 Rated speed : 2100

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.05)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1050

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 200.0

Rack travel in mm : 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.8...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position

Degree: -2

Speed rpm : 500

Rack travel in mm : 19.20...20.80

**FULL LOAD DELIV. AT FULL LOAD STOP**

**1st version**

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 124.5...126.5

1000 : (122.5...128.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

**RATED SPEED**

**1st version**

Setting point:

Speed rpm : 500

Rack travel in mm : 20.0

**Testing:**

1st rack travel in: 11.40

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1130...1160

4th rack travel in: 1225  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 200  
Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 8.00  
Speed rpm : 200  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 290...330

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.40...12.50  
2nd speed rpm : 450  
Rack travel in m: 13.40...13.80  
3rd speed rpm : 680  
Rack travel in m: 12.90...13.30  
4th speed rpm : 830  
Rack travel in m: 12.60...12.90

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 13.20...13.30

#### Measurement

Speed 1/min : 500  
Rack travel in m: 10.80...11.00  
2nd pressure hPa : 220  
Rack travel in m: 12.40...12.50  
3rd pressure hPa : 150  
Rack travel in m: 11.10...11.30

#### START CUT-OUT

Speed 1/min : 140 (160)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 120.5...123.5  
1000 s: (118.0...126.0)  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (77.0...83.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 153.0...163.0  
1000 s: (150.0...166.0)  
Rack travel in mm : 17.50...17.70

#### Remarks:

Set idle stop at 200 min -1 to a  
control-rod travel of 6.4 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 y  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 579  
 Injection pump  
 Pump designation : PES6A95D320RS2779  
 EP type number : 0 410 896 903  
 Governor  
 Governor design. : RQV350...1350AB1248-  
 R  
 Governor no. : 0 420 213 120

Customer-spec. information  
 Customer : NAVISTAR

Engine : DT 360

1st version kW : 126.0  
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 110

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1390...1420  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 240  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 445  
Rack travel in m: 11.20...11.60

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 61.5...65.5  
1000 s: (59.5...67.5)

BREAKAWAY

G19

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks: : NAVISTAR #1816726C91

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark is at start of  
delivery of cylinder 1



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC 7,6 y 1  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 580  
 Injection pump  
 Pump designation : PES6A95D320RS2779  
 EP type number : 0 410 896 903  
 Governor  
 Governor design. : RQV350...1350AB1248-1R  
 Governor no. : 0 420 213 121

Customer-spec. information  
 Customer : NAVISTAR

Engine : DTA 360

1st version kW : 138.0  
 Rated speed : 2700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
 assembly : 1 688 901 110

Opening  
 pressure, bar : 250...253

Orifice plate  
 diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
 : (2.60...2.80)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1350  
 Rack travel in mm : 12.30...12.40  
 Del. quantity cm<sup>3</sup>/ : 8.4...8.6  
 100 s : (8.2...8.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del. quantity cm<sup>3</sup>/ : 1.7...2.1  
 100 s : (1.5...2.3)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
 travel mm : 7.30...7.50  
 2nd speed rpm : 1460  
 travel mm : 8.10...8.50  
 3rd speed rpm : 550  
 travel mm : 3.10...3.70  
 4th speed rpm : 350  
 travel mm : 1.30...1.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1350  
 Aneroid pressure h: 900  
 Del. quantity : 84.0...86.0  
 1000 : (82.0...88.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1390...1420  
2nd rack travel in: 4.00  
Speed rpm : 1525...1535  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.40  
2nd pressure hPa : 215  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 430  
Rack travel in m: 11.30...11.70

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 63.5...67.5  
1000 s: (62.5...69.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1390...1420

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks: : NAVISTAR #1816728C91

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark is at start of  
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 j  
 Edition : 31.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 584  
 Injection pump  
 Pump designation : PES6A95D41ORS2797  
 EP type number : 0 410 896 900  
 Governor  
 Governor design. : RQV300...1400AB1065-20L  
 Governor no. : 0 420 212 225

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 97.0  
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1400  
 Rack travel in mm : 9.30...9.40  
 Del. quantity cm<sup>3</sup>/ : 6.6...6.8  
 100 s : (6.4...7.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 8.0...8.2  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.2  
 100 s : (0.5...1.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...1.30  
 2nd speed rpm : 500  
 travel mm : 2.30...2.80  
 3rd speed rpm : 750  
 travel mm : 4.10...4.30  
 4th speed rpm : 1500  
 travel mm : 8.50...8.60

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1450  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1400  
 Del. quantity : 66.0...68.0  
 1000 : (64.0...70.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
Control Lever  
position degrees: 109...117

Testing:  
1st rack travel in: 8.30  
Speed rpm : 1450...1460  
2nd rack travel in: 4.00  
Speed rpm : 1520...1550  
4th rack travel in: 1670  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control Lever  
position degrees: 70...78

Testing:  
Speed rpm : 100  
Minimum rack trave: 9.50  
Speed rpm : 300  
Rack travel in mm : 8.00...8.20

CONSTANT REGULATION  
Speed rpm : 450...580

TORQUE CONTROL  
Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 600  
Rack travel in m: 10.20...10.40  
3rd speed rpm : 900  
Rack travel in m: 9.50...9.80

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 53.0...56.0  
1000 s: (50.5...58.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)  
Rack travel in mm : 13.70...14.10

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 3,1 b 2  
 Edition : 31.08.90  
 Replaces : 30.3.90  
 Test oil : ISO-4113

Combination no. : 0 400 863 008

Injection pump  
 Pump designation : PES3A90D320/3RS2658  
 EP type number : 0 410 893 004  
 Governor  
 Governor design. : RSV325...150DA2C505-3R  
 Governor no. : 0 420 233 229

Customer-spec. information  
 Customer : MWM

Engine : D226B-3

1st version kW : 49.5  
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 2- 3

Phasing : 0-120-240  
 Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 11.20...11.30

---

Del.quantity cm<sup>3</sup>/ : 8.9...9.0  
 100 s: (8.7...9.2)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 9.7...9.9  
 Del.quantity cm<sup>3</sup>/ : 4.6...5.2  
 100 s: (4.4...5.4)

Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Del.quantity : 89.5...90.5  
 1000 : (87.5...92.5)

Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 89...97

Testing:

1st rack travel in: 10.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1375  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 9.3  
Speed rpm : 325  
Rack travel in mm : 9.70...9.90  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0  
1000 s: ( 112.0)  
Rack travel in mm : 16.80...21.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 3,0 f  
Edition : 21.05.90  
Replaces : 6.4.90  
Test oil : ISO-4113  
  
Combination no. : 0 400 863 016  
  
Injection pump  
Pump designation : PES3A85D410/3RS2780  
EP type number : 0 410 883 987  
Governor  
Governor design. : RSV325...1250A2C2239  
-1L  
Governor no. : 0 420 232 533

Customer-spec. information  
Customer : KHD

Engine : F3L912 F

1st version kW : 40.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
: (2.90...3.10)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 2

Phasing : 0-120-240  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1235  

---

Rack travel in mm : 11.40...11.50  

---

Del. quantity cm<sup>3</sup>/ : 6.4...6.5  
100 s : (6.2...6.7)  

---

Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

2nd speed rpm : 325.0  
Rack travel in mm : 8.1...8.3  
Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s : (0.8...1.8)  
Spread cm<sup>3</sup> : 0.2  
100 s : (0.4)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1235  
Del. quantity : 64.0...65.0  
1000 : (62.0...67.0)  
Spread cm<sup>3</sup> : 3.00  
1000 : (5.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1275...1285  
2nd rack travel in: 4.00

Speed rpm : 1345...1375  
3rd rack travel in: 4.00  
Speed rpm : 1355...1385  
4th rack travel in: 1520  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 435...495

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1235  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 500  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 840  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm3/ : 55.0...57.0  
1000 s: (52.5...59.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1275...1285

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 4,1 b 1  
 Edition : 31.08.90  
 Replaces : 5.8.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 864 057  
 Injection pump  
 Pump designation : PES4A90D320/3RS2659  
 EP type number : 0 410 894 028  
 Governor  
 Governor design. : RSV325...1500A2C505-  
 2R  
 Governor no. : 0 420 233 196

Customer-spec. information  
 Customer : MWM

Engine : D226B-4

1st version kW : 73.5  
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1500  


---

 Rack travel in mm : 11.20...11.30  


---

 Del. quantity cm<sup>3</sup>/ : 9.0...9.1  
 100 s: (8.8...9.3)  


---

 Spread cm<sup>3</sup> : 0.3  


---

 100 s: (0.5)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 7.0...7.2  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.4  
 100 s: (0.6...1.6)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1500  
 Del. quantity : 90.0...91.0  
 1000 : (88.0...93.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 109...117

Testing:

1st rack travel in: 9.50  
Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1590...1620  
3rd rack travel in: 4.00  
Speed rpm : 1615...1645  
4th rack travel in: 1780  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.00...7.20  
Rack travel in mm : 2.00  
Speed rpm : 465...525

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1540...1550

STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 4,1 i  
 Edition : 21.05.90  
 Replaces : 6.4.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 864 075  
 Injection pump  
 Pump designation : PES4A85D410/3RS2781  
 EP type number : 0 410 884 945  
 Governor  
 Governor design. : RSV325...1250A2C2239  
 -1L  
 Governor no. : 0 420 232 533

Customer-spec. information  
 Customer : KHD

Engine : F4L912F

1st version kw : 54.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1235  
 Rack travel in mm : 11.40...11.50  
 Del. quantity cm<sup>3</sup>/ : 6.4...6.5  
 100 s: (6.2...6.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 8.1...8.3  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.8...1.8)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1235  
 Del. quantity : 64.0...65.0  
 1000 : (62.0...67.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 100...108

Testing:

1st rack travel in: 10.40  
 Speed rpm : 1275...1285  
 2nd rack travel in: 4.00  
 Speed rpm : 1345...1375  
 3rd rack travel in: 4.00

Speed rpm : 1355...1385  
4th rack travel in: 1520  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 435...495

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1235  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 500  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 840  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 55.0...57.0  
1000 s: (52.5...59.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1275...1285

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...125.0  
1000 s: (112.0...128.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 4,1 b 3
Edition : 31.08.90
Replaces : -
Test oil : ISO-4113
Combination no. : 0 400 864 079
Injection pump
Pump designation : PES4A90D320/3RS2659
EP type number : 0 410 894 028
Governor
Governor design. : RSV325...1175A0C2247
-1R
Governor no. : 0 420 233 271

Customer-spec. information
Customer : MWM

Engine : TD224/ 4

1st version kW : 72.0
Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05
: (2.90...3.10)

H04

Rack travel in mm : 9.00...12.00
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00
& maximum rack tra: 21.00
Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1175
Rack travel in mm : 10.80...10.90
Del.quantity cm3/ : 8.0...8.1
100 s: (7.8...8.3)
Spread cm3 : 0.3
100 s: (0.5)

2nd speed rpm : 325.0
Rack travel in mm : 7.0...7.2
Del.quantity cm3/ : 0.8...1.4
100 s: (0.6...1.6)
Spread cm3 : 0.2
100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...0.70

Governor spring pre-tension
Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1175
Aneroid pressure h: 700
Del.quantity : 80.5...81.5
1000 : (78.5...83.5)
Spread cm3 : 3.00
1000 : (5.00)

RATED SPEED

1st version
Control lever
position degrees: 93...101

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1215...1225  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
3rd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1430  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 500  
Rack travel in m: 11.70...11.80  
4th speed rpm : 920  
Rack travel in m: 11.20...11.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...10.80  
2nd pressure hPa : 310  
Rack travel in m: 11.20...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750

Del.quantity cm3/ : 81.0...83.0  
1000 s: (78.5...85.5)  
Aneroid pressure h: 230  
Speed rpm : 600  
Del.quantity cm3/ : 72.5...74.5  
1000 s: (70.0...77.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 63.0...64.0  
1000 s: (61.0...66.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1215...1225

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks: : RENAULT

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 6,1 a11  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 083  
 Injection pump  
 Pump designation : PES6A85D410/3RS2532  
 EP type number : 0 410 886 909  
 Governor  
 Governor design. : RSV325...1400A8C674-4L  
 Governor no. : 0 420 232 544

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 1.90...2.00  
 : (1.85...2.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 12.40...12.50  
 Del.quantity cm<sup>3</sup>/ : 8.3...8.4  
 100 s: (8.1...8.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.4)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 6.6...6.8  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.7...1.7)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.70...1.00

Governor spring pre-tension  
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Aneroid pressure h: 500  
 Del.quantity : 83.5...84.5  
 1000 : (81.5...86.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (4.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 67...75

Testing:

1st rack travel in: 11.40  
 Speed rpm : 1440...1450  
 2nd rack travel in: 4.00  
 Speed rpm : 1485...1515  
 4th rack travel in: 1620  
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 17...25

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 6.2

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 325

Rack travel in mm : 6.60...6.80

Rack travel in mm : 2.00

Speed rpm : 585...645

Speed rpm : 700

Maximum rack trave: 1.00

TORQUE CONTROL

2nd speed rpm : 500

Rack travel in m: 13.70...13.80

3rd speed rpm : 1000

Rack travel in m: 13.30...13.50

4th speed rpm : 1400

Rack travel in m: 12.40...12.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 500

1st pressure hPa : 375

Rack travel in m: 13.40...13.50

2nd pressure hPa : 160

Rack travel in m: 12.30...12.60

3rd pressure hPa : -

Rack travel in m: 11.80...11.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 60.0...63.0

1000 s: (58.0...65.0)

Spread cm3 : -

1000 s: (5.50)

BREAKAWAY

1st version

H07

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 17.60...18.20

LOW IDLE

Speed rpm : 325

Rack travel in mm : 6.60...6.80

Del.quantity cm3/ : 9.0...15.0

1000 s: (7.0...17.0)

Spread cm3 : 2.00

1000 s: (4.00)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 1 g 46  
 Edition : 17.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 111  
 Injection pump  
 Pump designation : PES6A85D410/3RS2611  
 EP type number : 0 410 886 902  
 Governor  
 Governor design. : RSV325...1200AOC2148  
 L  
 Govenner no. : 0 420 232 293

Customer-spec. information  
 Customer : KHD

Engine : F6L913

1st version kW : 85.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.4...8.6

Del. quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del. quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 101...109

Testing:

1st rack travel in: 9.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1295...1325

4th rack travel in: 1460

Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 8.5

Speed rpm : 325

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 450...510

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 11.10...11.30

4th speed rpm : 1000

Rack travel in m: 10.80...12.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 54.0...56.0

1000 s: (51.5...58.5)

Speed rpm : 1000

Del.quantity cm<sup>3</sup>/ : 60.0...62.0

1000 s: (57.5...64.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 100.0...110.0

1000 s: (97.0...113.0)

Rack travel in mm : 16.90...17.30

Remarks:

: DX6.30

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e 4  
 Edition : 31.08.90  
 Replaces : 21.4.89  
 Test oil : ISO-4113

Combination no. : 0 400 866 112

Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...1500A2C505-  
 2R

Governer no. : 0 420 233 196

Customer spec. information  
 Customer : MWM

Engine : D226-6

1st version kW : 110.0  
 Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00x2.00x600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.20...11.30

Del. quantity cm<sup>3</sup>/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.0...7.2

Del. quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del. quantity : 89.5...90.5

1000 : (87.5...92.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 109...117

Testing:

1st rack travel in: 10.20  
Speed rpm : 1540...1550  
2nd rack travel in: 4.00  
Speed rpm : 1590...1620  
3rd rack travel in: 4.00  
Speed rpm : 1605...1635  
4th rack travel in: 1780  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.6

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.00...7.20  
Rack travel in mm : 2.00  
Speed rpm : 450...510

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1500  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.40

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1540...1550

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

Generator set

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MM 6,2 e 6  
 Edition : 21.05.90  
 Replaces : 18.12.87  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 122  
 Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...1200AGC2182  
 -3R  
 Governor no. : 0 420 233 212

Customer-spec. information  
 Customer : MM

Engine : TD226B-6

1st version kw : 123.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1180

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 8.9...9.0

100 s: (8.7...9.2)

Spread cm3 : 0.3

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1180

Aneroid pressure h: 700

Del.quantity : 89.0...90.0

1000 : (87.0...92.0)

Spread cm3 : 3.00

1000 : (4.50)

RATED SPEED

1st version

Control lever  
position degrees: 90...98

Testing:

1st rack travel in: 10.60  
Speed rpm : 1220...1230  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
3rd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1435  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.7

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.10...7.30  
Rack travel in mm : 2.00  
Speed rpm : 485...545

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1180  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 500  
Rack travel in m: 12.40...12.50  
4th speed rpm : 890  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 12.40...12.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 400  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 210  
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 92.0...94.0  
1000 s: (89.5...96.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 59.5...61.5  
1000 s: (57.5...63.5)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.60  
Speed rpm : 1220...1230

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 128.0...138.0  
1000 s: (125.0...141.0)  
Rack travel in mm : 19.50...21.00

Remarks:

APPLICATION

Tractor (tractor engines)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : KHD 6,1 r  
 Edition : 17.05.90  
 Replaces : 3.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 125  
 Injection pump  
 Pump designation : PES6A85D410/3RS2761  
 EP type number : 0 410 886 895  
 Governor  
 Governor design. : RSV325...1150A8C674-  
 1L  
 Governor no. : 0 420 232 518

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

1st version kW : 112.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 12.10...12.20  
 Del.quantity cm<sup>3</sup>/ : 8.4...8.5  
 100 s: (8.2...8.7)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.5...7.7  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.5  
 100 s: (0.7...1.7)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 700  
 Del.quantity : 84.5...85.5  
 1000 : (82.5...87.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 98...106

Testing:  
 1st rack travel in: 11.10  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1225...1255

3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1410  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 855  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.90...12.00  
3rd pressure hPa : 700  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 64.5...65.5  
1000 s: (62.5...67.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 17.00...17.40

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 r 1  
Edition : 17.05.90  
Replaces : 3.11.89  
Test oil : ISO-4113

Combination no. : 0 400 866 126

Injection pump  
Pump designation : PES6A85D410/3RS2761  
EP type number : 0 410 886 895  
Governor  
Governor design. : RSV325...1150A8C673-  
2L  
Governor no. : 0 420 232 519

Customer-spec. information  
Customer : KHD

Engine : BF6L913

1st version kW : 112.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.5...7.7

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Testing:

1st rack travel in: 11.10

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00

Speed rpm : 1240...1270  
4th rack travel in: 1410  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 855  
Rack travel in m: 12.30...12.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 17.00...17.40

Remarks:

: ORENSTEIN U. KOPPEL

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 r 2  
 Edition : 17.05.90  
 Replaces : 3.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 127  
 Injection pump  
 Pump designation : PES6A85D410/3RS2761  
 EP type number : 0 410 886 895  
 Governor  
 Governor design. : RSV325...1150A8C707-5L  
 Governor no. : 0 420 232 517

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

1st version kW : 112.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.10...12.20

Del. quantity cm<sup>3</sup>/ : 8.4...8.5

100 s: (8.2...8.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 7.5...7.7

Del. quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.7...1.7)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 700

Del. quantity : 84.5...85.5

1000 : (82.5...87.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control Lever

position degrees: 98...106

Testing:

1st rack travel in: 11.10

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1410  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 7.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.50...7.70  
Rack travel in mm : 2.00  
Speed rpm : 430...490

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 500  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 855  
Rack travel in m: 12.30...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500  
1st pressure hPa : 350  
Rack travel in m: 11.90...12.00  
3rd pressure hPa : 700  
Rack travel in m: 12.60...12.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 87.0...89.0  
1000 s: (84.5...91.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 64.5...65.5  
1000 s: (62.5...67.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 17.00...17.40

Remarks: : VIBROMAX

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 l 3  
Edition : 17.05.90  
Replaces : 2.5.89  
Test oil : ISO-4113

Combination no. : 0 400 866 1290A

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1200AOC2190  
Governor no. : 0 420 233

Cust. part no. : 3913290

Customer-spec. information  
Customer : C.D.C

Engine : 6 CT

1st version kW : 101.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H2O

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...3.00)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.00...10.10

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 87.5...89.5

1000 : (85.5...91.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 54...62

Testing:

1st rack travel in: 9.00  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1315...1345  
3rd rack travel in: 4.00  
Speed rpm : 1315...1345  
4th rack travel in: 1400  
Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.00...10.10  
2nd speed rpm : 800  
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm3/ : 87.5...91.5  
1000 s: (85.5...93.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00  
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.40...5.60

Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 L 4  
 Edition : 17.05.90  
 Replaces : 2.5.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 1290B  
 Injection pump  
 Pump designation : PES6A100D320/3RS2763  
 EP type number : 0 410 806 006  
 Governor  
 Governor design. : RSV400...1200A0C2190  
 Governor no. : 0 420 233

Cust. part no. : 3915977

Customer-spec. information  
 Customer : C.D.C

Engine : 6 CT

1st version kW : 101.0  
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...3.00)

Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.00...10.10

Del.quantity cm<sup>3</sup>/ : 8.7...8.9

100 s : (8.5...9.1)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s : (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 87.5...89.5

1000 : (85.5...91.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 54...62

Testing:

1st rack travel in: 9.00  
 Speed rpm : 1240...1250  
 2nd rack travel in: 4.00  
 Speed rpm : 1315...1345  
 3rd rack travel in: 4.00  
 Speed rpm : 1315...1345  
 4th rack travel in: 1400  
 Speed rpm : 0.30...0.70

LOW IDLE 1

Control lever  
 position degrees: 32...40  
 Setting point w/out bumper spring  
 Speed rpm : 400  
 Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
 Minimum rack trave: 19.00  
 Speed rpm : 400  
 Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version  
 1st speed rpm : 1200  
 Rack travel in m: 10.00...10.10  
 2nd speed rpm : 800  
 Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
 Del.quantity cm3/ : 87.5...91.5  
 1000 s: (85.5...93.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00  
 Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
 Del.quantity cm3/ : 150.0...170.0  
 1000 s: (145.0...175.0)  
 Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400  
 Rack travel in mm : 5.40...5.60

Del.quantity cm3/ : 16.0...20.0  
 1000 s: (13.5...22.5)  
 Spread cm3 : 3.50  
 1000 s: (5.50)

Remarks:

Adjust stop lever to 0.5...1.0 mm  
 before stop.

Start-of-delivery mark 11° cam angle  
 after start of delivery cyl. 1



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 l 5  
Edition : 17.05.90  
Replaces : 2.5.89  
Test oil : ISO-4113

Combination no. : 0 400 866 1290C

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV425...1100A0C2190  
Governor no. : 0 420 233

Cust. part no. : 3915989

Customer-spec. information  
Customer : C.D.C

Engine : 6 CT

1st version kW : 127.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

H24

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
                  : (2.75...3.00)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.0...5.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 93.5...95.5

1000 : (91.5...97.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control Lever

position degrees: 45...53

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
3rd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1250  
Speed rpm : 0.30...0.70

LOW IDLE 1  
Control lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.00...5.20

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
1000 s: (118.0...126.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.00...5.20

Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

:  
Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : CUM 8,3 a63  
 Edition : 09.07.90  
 Replaces : 2.5.89  
 Test oil : ISO-4113

Combination no. : 0 400 866 132

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV500...1250AOC2190  
 -28R  
 Governor no. : 0 420 233 231

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CT-I 8.3ltr.

1st version kW : 139.0  
 Rated speed : 2500

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1250  


---

 Rack travel in mm : 11.40...11.50  


---

 Del. quantity cm<sup>3</sup>/ : 10.1...10.3  
 100 s: (9.9...10.5)  


---

 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 500.0  
 Rack travel in mm : 5.5...5.7  
 Del. quantity cm<sup>3</sup>/ : 1.3...1.7  
 100 s: (1.0...1.9)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1250  
 Del. quantity : 101.5...103.5  
 1000 : (99.5...105.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 43...51

Testing:

1st rack travel in: 10.40  
Speed rpm : 1315...1325  
2nd rack travel in: 4.00  
Speed rpm : 1365...1375  
3rd rack travel in: 4.00  
Speed rpm : 1365...1395  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 5.1

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 5.50...5.70

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1315...1325

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3915687

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a64  
Edition : 17.05.90  
Replaces : 2.5.89  
Test oil : ISO-4113  
  
Combination no. : 0 400 866 132LA  
  
Injection pump  
Pump designation : PES6A100D320/3RS2691  
EP type number : 9 410 230 025  
Governor  
Governor design. : RSV400...1050AOC2190  
Governor no. : 9 420 234

Cust. part no. : 3915948

Customer-spec. information  
Customer : C.D.C.

Engine : 6 C 8.3

1st version kW : 174.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  

---

Rack travel in mm : 12.90...13.00  

---

Del. quantity cm<sup>3</sup>/ : 12.9...13.1  
100 s: (12.7...13.3)  

---

Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)  

---

2nd speed rpm : 400.0  
Rack travel in mm : 5.8...6.0  
Del. quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.3...2.2)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del. quantity : 129.0...131.0  
1000 : (127.0...133.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 37...45

Testing:

1st rack travel in: 11.90  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
3rd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1250  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 18...26  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.80...6.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1095...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 5,9 v 2  
 Edition : 31.07.90  
 Replaces : 24.5.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 143  
 Injection pump  
 Pump designation : PES6A95D12ORS2773  
 EP type number : 0 410 896 904  
 Governor  
 Governor design. : RSV350...1250AOC2237  
 R  
 Governor no. : 0 420 233 240

Customer-spec. information  
 Customer : CUMMINS

Engine : 6BT

1st version kW : 118.0  
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20  
 : (2.05...2.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1250  
 Rack travel in mm : 9.40...9.50  
 Del.quantity cm<sup>3</sup>/ : 8.6...8.8  
 100 s : (8.3...9.0)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.1...6.3  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s : (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1250  
 Del.quantity : 86.0...88.0  
 1000 : (83.5...90.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 91...99

Testing:  
 1st rack travel in: 8.40  
 Speed rpm : 1290...1300

2nd rack travel in: 4.00  
Speed rpm : 1355...1385  
3rd rack travel in: 4.00  
Speed rpm : 1370...1400  
4th rack travel in: 1530  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 465...525

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 69.5...72.5  
1000 s: (67.5...74.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 107.0...117.0  
1000 s: (104.0...120.0)  
Rack travel in mm : 14.10...14.50

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.10...6.30  
Del. quantity cm<sup>3</sup>/ : 10.0...16.0  
1000 s: (7.5...18.5)

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery mark 11.5° cam angle  
after start of delivery cyl. 1



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L10  
 Edition : 09.07.90  
 Replaces : 6.3.90  
 Test oil : ISO-4113

Combination no. : 0 400 866 148

Injection pump  
 Pump designation : PES6A100D320/3RS2763  
 EP type number : 0 410 806 006  
 Governor  
 Governor design. : RSV415...1175A0C2190  
 -43R  
 Governor no. : 0 420 233 249

Customer-spec. information  
 Customer : C.D.C

Engine : 6 CT

1st version kW : 129.0  
 Rated speed : 2350

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s : (9.4...10.0)

Spread cm<sup>3</sup> : 0.4

100 s : (0.6)

2nd speed rpm : 415.0

Rack travel in mm : 5.1...5.3

Del.quantity cm<sup>3</sup>/ : 1.5...1.9

100 s : (1.3...2.1)

Spread cm<sup>3</sup> : 0.6

100 s : (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever  
 position degrees: 56...64

Testing:

1st rack travel in: 9.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1295...1325  
3rd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1350  
Speed rpm : 0.30...0.70

#### LOW IDLE 1

Control lever  
position degrees: 32...40  
Setting point w/out bumper spring  
Speed rpm : 415  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 415  
Rack travel in mm : 5.10...5.30

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 800  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 98.0...102.0  
1000 s: (96.0...104.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 415  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 15.0...19.0  
1000 s: (13.0...21.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3919459

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 8,3 L12  
 Edition : 09.07.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 149  
 Injection pump  
 Pump designation : PES6A100D320/3RS2763  
 EP type number : 0 410 806 006  
 Governor  
 Governor design. : RSV375...1000A0C2190  
 -44R  
 Governor no. : 0 420 233 250

**Customer-spec. information**

Customer : C.D.C.

Engine : 6 CTA

1st version kW : 166.0  
 Rated speed : 2000

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 1000  
 Rack travel in mm : 12.90...13.00  
 Del.quantity cm<sup>3</sup>/ : 13.2...13.4  
 100 s: (13.0...13.6)  
 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 375.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 1.4...1.8  
 100 s: (1.2...2.0)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1000  
 Del.quantity : 132.5...134.5  
 1000 : (130.5...136.5)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 37...45

Testing:

1st rack travel in: 11.90  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
3rd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1200  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 15...23  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 4.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.30...5.50

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 750  
Rack travel in m: 13.60...13.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 141.5...145.5  
1000 s: (139.5...147.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...165.0  
1000 s: (140.0...170.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (12.0...20.0)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3915570

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 o  
Edition : 09.07.90  
Replaces : 1.2.90  
Test oil : ISO-4113

Combination no. : 0 400 866 151

Injection pump  
Pump designation : PES6A100D320/3RS2691  
-4

EP type number : 9 410 230 030  
Governor  
Governor design. : RSV450...1100A0C2238  
R  
Governor no. : 0 420 233 254

## Customer-spec. information

Customer : C.D.C.

Engine : 6CT830

1st version kW : 151.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm<sup>3</sup>/ : 11.8...12.0  
100 s: (11.6...12.2)

---

Spread cm<sup>3</sup> : 0.4  
100 s: (0.6)

---

2nd speed rpm : 450.0  
Rack travel in mm : 5.7...5.9  
Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 900  
Del.quantity : 118.5...120.5  
1000 : (116.5...122.5)

Spread cm<sup>3</sup> : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 42...50

Testing:

1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.30

Measurement

Speed 1/min : 500  
1st pressure hPa : -  
Rack travel in m: 10.40...10.60  
2nd pressure hPa : 385  
Rack travel in m: 11.40...11.50  
3rd pressure hPa : 560  
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 133.0...137.0  
1000 s: (131.0...139.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 78.0...80.0  
1000 s: (76.0...82.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: C.D.C. # 3915996

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : CUM 5,9 v 1  
 Edition : 31.07.90  
 Replaces : 20.10.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 157  
 Injection pump  
 Pump designation : PES6A95D120RS2773  
 EP type number : 0 410 896 904  
 Governor  
 Governor design. : RSV350...1300A0C2237  
 -1R  
 Governor no. : 0 420 233 260

Customer-spec. information  
 Customer : CUMMINS

Engine : 6BT 5.9

1st version kW : 108.0  
 Rated speed : 2600

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20  
 : (2.05...2.25)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1300  
 Rack travel in mm : 8.10...8.20  
 Del.quantity cm<sup>3</sup>/ : 7.5...7.7  
 100 s : (7.2...7.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s : (0.7...1.8)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.50

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1300  
 Del.quantity : 75.0...77.0  
 1000 : (72.5...79.5)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control Lever  
 position degrees: 95...103

Testing:  
 1st rack travel in: 7.10  
 Speed rpm : 1340...1350

2nd rack travel in: 4.00  
Speed rpm : 1405...1435  
3rd rack travel in: 4.00  
Speed rpm : 1410...1440  
4th rack travel in: 1550  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL  
Dimension a mm : 0.35  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 8.10...8.20  
2nd speed rpm : 500  
Rack travel in m: 8.50...8.60  
3rd speed rpm : 940  
Rack travel in m: 8.30...8.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm3/ : 56.0...59.0  
1000 s: (54.0...61.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 7.10  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)  
Rack travel in mm : 13.00...13.20

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 10.0...16.0  
1000 s: (7.5...18.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11.5° cam angle  
after start of delivery cyl. 1



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a77  
 Edition : 08.06.90  
 Replaces : 6.3.90  
 Test oil : ISO-4113

Combination no. : 0 400 866 160

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV470...1100A0C2190  
 -48R  
 Governor no. : 0 420 233 262

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CT830

1st version kW : 150.6  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.10...12.20

Del.quantity cm<sup>3</sup>/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 470.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.10  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1235  
3rd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 26...34  
Setting point w/out bumper spring  
Speed rpm : 470  
Rack travel in mm : 5.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 470  
Rack travel in mm : 5.70...5.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 750  
Rack travel in m: 12.40...12.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 116.0...120.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 125.0...145.0  
1000 s: (120.0...150.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 470  
Rack travel in mm : 5.70...5.90  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3917962

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 a78  
 Edition : 09.07.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 400 866 161

Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 025  
 Governor  
 Governor design. : RSV400...1000AOC2190  
 -49R  
 Governor no. : 0 420 233 263

Customer-spec. information  
 Customer : C.D.C.

Engine : 6 CT 8.3

1st version kW : 151.4  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000  


---

 Rack travel in mm : 12.10...12.20  


---

 Del.quantity cm<sup>3</sup>/ : 11.9...12.1  
 100 s: (11.7...12.3)  


---

 Spread cm<sup>3</sup> : 0.4  
 100 s: (0.6)

2nd speed rpm : 400.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.0  
 100 s: (1.3...2.2)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 119.0...121.0  
 1000 : (117.0...123.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (6.50)

RATED SPEED

1st version  
 Control lever  
 position degrees: 36...44

Testing:

1st rack travel in: 11.10  
Speed rpm : 1050...1060  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
3rd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1175  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1050...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3915963

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e 8  
 Edition : 31.07.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 163  
 Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...1175A0C2247  
 R  
 Governor no. : 0 420 233 264

Customer-spec. information  
 Customer : MWM

Engine : TD2268-6

1st version kW : 107.0  
 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.95...3.05  
 : (2.90...3.10)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1175  
 Rack travel in mm : 10.30...10.40  
 Del. quantity cm<sup>3</sup>/ : 7.6...7.7  
 100 s : (7.4...7.9)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 6.7...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s : (0.8...1.8)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1175  
 Aneroid pressure h: 700  
 Del. quantity : 76.0...77.0  
 1000 : (74.0...79.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version

Control lever  
position degrees: 92...100

Testing:

1st rack travel in: 9.30  
Speed rpm : 1215...1225  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
3rd rack travel in: 4.50  
Speed rpm : 1255...1285  
4th rack travel in: 1430  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 485...555

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.50  
4th speed rpm : 880  
Rack travel in m: 10.80...11.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 275  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 210  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (76.5...83.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 60.0...61.0  
1000 s: (58.0...63.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 9.30  
Speed rpm : 1215...1225

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

Remarks:

: RENAULT

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 e 9  
 Edition : 29.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 164  
 Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...1200AOC2249  
 R  
 Governor no. : 0 420 233 265

Customer-spec. information  
 Customer : MWM

Engine : TD2268-6

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 0 681 343 009  
 Opening pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_  
 BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27  
 Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.30...10.40

Del.quantity cm<sup>3</sup>/ : 7.6...7.7

100 s: (7.4...7.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100 s: (0.8...1.8)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 76.0...77.0

1000 : (74.0...79.0)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 9.30  
Speed rpm : 1240...1250  
2nd rack travel in: 4.50  
Speed rpm : 1260...1290  
3rd rack travel in: 4.50  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 485...545

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.50  
4th speed rpm : 870  
Rack travel in m: 10.80...11.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 275  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 190  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 79.0...81.0  
1000 s: (76.5...83.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 60.0...61.0  
1000 s: (58.0...63.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 128.0...138.0  
1000 s: (125.0...141.0)  
Rack travel in mm : 19.50...21.00

Remarks: : RENAULT

#### APPLICATION

Tractor (tractor engines)



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MWM 6,2 e10  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 165  
 Injection pump  
 Pump designation : PES6A90D320/3RS2660  
 EP type number : 0 410 896 078  
 Governor  
 Governor design. : RSV325...900A1C2250R  
 Governor no. : 0 420 233 266

Customer-spec. information  
 Customer : MWM

Engine : TD226B-6

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.95...3.05  
 : (2.90...3.10)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : -1

**BEGINNING OF DELIVERY DIFFERENCE**

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.50...4.50

**BASIC SETTING**

1st speed rpm : 900  


---

 Rack travel in mm : 12.00...12.10  


---

 Del.quantity cm<sup>3</sup>/ : 9.4...9.5  
 100 s: (9.2...9.7)  


---

 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.0...7.2  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s: (0.8...1.8)  
 Spread cm<sup>3</sup> : 0.2  
 100 s: (0.4)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 900  
 Del.quantity : 94.5...95.5  
 1000 : (92.5...97.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

**RATED SPEED**

1st version  
 Control Lever  
 position degrees: 93...101

Testing:  
 1st rack travel in: 11.00

Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 970...1000  
3rd rack travel in: 4.00  
Speed rpm : 980...1010  
4th rack travel in: 1145  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 370...430

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 500  
Rack travel in m: 12.00...12.20

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 133.0...143.0  
1000 s: (130.0...146.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 3,4 a  
 Edition : 10.08.90  
 Replaces : 11.7.88  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 245  
 Injection pump  
 Pump designation : PES4A85D410RS2746  
 EP type number : 0 410 884 946  
 Governor  
 Governor design. : RSV300...1100A1C2227  
 L  
 Govenor no. : 0 420 232 491

Customer-spec. information  
 Customer : STEYR

Engine : WD411.87/88/91

1st version kW : 57.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.85...2.95  
 : (2.80...3.00)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 6.7...6.8

100 s: (6.5...7.0)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.7)

Spread cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 67.5...68.5

1000 : (65.5...70.5)

Spread cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 9.40

Speed rpm : 1140...1150

2nd rack travel in: 4.00

Tractor (tractor engines)

Speed rpm : 1155...1185  
3rd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1335  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 365...425

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 500  
Rack travel in m: 11.30...11.40  
4th speed rpm : 915  
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 65.0...67.0  
1000 s: (62.5...69.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 95.0...105.0  
1000 s: (92.0...108.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

APPLICATION

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 e 7  
Edition : 08.06.90  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 876 240  
Injection pump  
Pump designation : PES6A95D410RS2471  
EP type number : 0 410 896 952  
Governor  
Governor design. : RSV325...1400A8C674-  
5L  
Governor no. : 0 420 232 545

Customer spec. information  
Customer : KHD

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 000  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test lines : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 1.90...2.00  
                  : (1.85...2.05)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1400  
Rack travel in mm : 9.20...9.30  
Del. quantity cm<sup>3</sup>/ : 8.5...8.7  
100 s : (8.3...8.9)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.6)  
2nd speed rpm : 325.0  
Rack travel in mm : 6.4...6.6

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00  
Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1400  
Aneroid pressure h: 500  
Del. quantity : 85.5...87.5  
1000 : (83.5...89.5)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 59...67

## Testing:

1st rack travel in: 8.20  
Speed rpm : 1440...1450  
2nd rack travel in: 4.00  
Speed rpm : 1455...1485  
3rd rack travel in: 4.00  
Speed rpm : 1475...1505  
4th rack travel in: 1640  
Speed rpm : 0.30...1.70

## LOW IDLE 1

Control lever  
position degrees: 13...21  
Setting point w/out bumper spring

Speed rpm : 325  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 555...615

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1400  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 500  
Rack travel in m: 10.50...10.60  
4th speed rpm : 1045  
Rack travel in m: 9.80...10.00

RACK STOP ADJUSTMENT

Speed rpm : 500

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 116.5...126.5  
1000 s: (113.5...129.5)

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

The stop position of the control rod must be easily reached with the stop lever

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : KHD 6,1 e 8  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 275  
 Injection pump  
 Pump designation : PES6A95D410RS2471  
 EP type number : 0 410 896 952  
 Governor  
 Governor design. : RSV325...1150A8C674-3L  
 Governor no. : 0 420 232 543  
 Customer-spec. information  
 Customer : KHD  
 Engine : BF6L913C  
 1st version kW : 132.0  
 Rated speed : 2300

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 11.80...11.90  
 Del.quantity cm<sup>3</sup>/ : 10.8...11.0  
 100 s: (10.6...11.2)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 325.0  
 Rack travel in mm : 7.2...7.4  
 Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 700  
 Del.quantity : 108.0...110.0  
 1000 : (106.0...112.0)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 102...110

Testing:  
 1st rack travel in: 10.80  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1235...1265

3rd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.20...7.40  
Rack travel in mm : 2.00  
Speed rpm : 585...645

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 500  
Rack travel in m: 11.80...12.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.80...11.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 220  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 140  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 103.5...106.5  
1000 s: (101.0...109.0)  
1000 s: (7.)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 62.0...64.0  
1000 s: (60.0...66.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 15.50...15.90

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

The stop position of the control rod  
must be easily reached with the stop  
lever

#### APPLICATION

Installation 2300



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : KHD 1 o 5  
 Edition : 08.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 305  
 Injection pump  
 Pump designation : PES6A95D410RS2625  
 EP type number : 0 410 896 926  
 Governor  
 Governor design. : RSV325...1150A8C674-  
 2L  
 Governor no. : 0 420 232 542

Customer-spec. information  
 Customer : KHD

Engine : BF6L913B

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 1.90...2.00  
 : (1.85...2.05)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

**BASIC SETTING**

1st speed rpm : 1150  
 Rack travel in mm : 11.40...11.50  
 Del. quantity cm<sup>3</sup>/ : 8.0...8.2  
 100 s : (7.8...8.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.6)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 7.2...7.4  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s : (1.3...2.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

**GUIDE SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : ?

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 700  
 Del. quantity : 80.0...82.0  
 1000 : (78.0...84.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

**RATED SPEED**

1st version  
 Control lever  
 position degrees: 96...104

**Testing:**

1st rack travel in: 10.40  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1205...1235  
 3rd rack travel in: 4.00  
 Speed rpm : 1265...1295  
 4th rack travel in: 1430

Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 61...69

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 6.8

Speed rpm : 325

Rack travel in mm : 7.20...7.40

Rack travel in mm : 2.00

Speed rpm : 585...645

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.40...11.50

2nd speed rpm : 500

Rack travel in m: 12.10...12.20

3rd speed rpm : 1000

Rack travel in m: 11.80...12.00

Aneroid/Altitude

Compensator Test

#### 1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 11.10...11.20

2nd pressure hPa : 355

Rack travel in m: 11.90...12.00

3rd pressure hPa : 200

Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 83.0...86.0

1000 s: (80.5...88.5)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 56.5...59.5

1000 s: (54.5...61.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 116.5...126.5

1000 s: (113.5...129.5)

Rack travel in mm : 15.90...16.40

Remarks:

:

#### APPLICATION

Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 o 3  
 Edition : 29.05.90  
 Replaces : 12.4.90  
 Test oil : ISO-4113

Combination no. : 0 400 876 327

Injection pump  
 Pump designation : PES6A95D320RS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300AOC2195  
 R  
 Govenor no. : 0 420 233 200

Customer-spec. information  
 Customer : DAF

Engine : DNT 620

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 11.60...11.70

---

Del.quantity cm<sup>3</sup>/ : 7.7...7.8

---

100 s: (7.5...8.0)

---

Spread cm<sup>3</sup> : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 700

Del.quantity : 77.5...78.5

1000 : (75.5...80.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 108...116

Testing:

1st rack travel in: 9.70  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
3rd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1580  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 600...660

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1060  
Rack travel in m: 11.00...11.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.60...11.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 250  
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 1290  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (71.5...78.5)

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 65.5...66.5  
1000 s: (63.5...68.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 o 2  
 Edition : 29.05.90  
 Replaces : 12.1.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 332  
 Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300ADC2206  
 R  
 Governor no. : 0 420 233 204

Customer-spec. information  
 Customer : DAF

Engine : DNTD 620

1st version kW : 110.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 6.5...6.6

100 s: (6.3...6.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del. quantity cm<sup>3</sup>/ : 0.7...1.1

100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Del. quantity : 65.5...66.5

1000 : (63.5...68.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 108...116

Testing:

1st rack travel in: 9.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
3rd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1570  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 590...650

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.20...10.40  
2nd speed rpm : 500  
Rack travel in m: 10.80...10.90  
4th speed rpm : 1005  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1290  
Del.quantity cm<sup>3</sup>/ : 69.0...71.0  
1000 s: (66.5...73.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...145.0  
1000 s: (127.0...148.0)

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 5,9 c  
 Edition : 21.05.90  
 Replaces : 30.3.90  
 Test oil : ISO-4113

Combination no. : 0 400 876 349

Injection pump  
 Pump designation : PES6A90D410RS2757  
 EP type number : 0 410 896 086  
 Governor  
 Governor design. : RSV425...1000A1C2233  
 L  
 Governor no. : 0 420 232 496

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8065.25.080

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 9.0...9.1  
 100 s : (8.8...9.3)

Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)

2nd speed rpm : 475.0  
 Rack travel in mm : 7.1...7.3  
 Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
 100 s : (0.8...1.8)

Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 800  
 Del.quantity : 90.0...91.0  
 1000 : (88.0...93.0)

Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 101...109

Testing:  
 1st rack travel in: 10.80  
 Speed rpm : 1040...1050  
 2nd rack travel in: 4.00  
 Speed rpm : 1090...1120  
 3rd rack travel in: 4.00

Speed rpm : 1140...1170  
4th rack travel in: 1240  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 77...85  
Setting point w/out bumper spring  
Speed rpm : 475  
Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 475  
Rack travel in mm : c 60...6.80  
Rack travel in mm : 2.00  
Speed rpm : 610...670

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.80...11.90  
2nd speed rpm : 500  
Rack travel in m: 11.80...12.00

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.50  
2nd pressure hPa : 780  
Rack travel in m: 11.70...11.80

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 85.0...95.0  
1000 s: (82.0...98.0)  
Rack travel in mm : 19.50...21.00

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

K07

On activation of the starting solenoid,  
the start position must be reached.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 6,2 o 5  
 Edition : 29.05.90  
 Replaces : 12.1.90  
 Test oil : ISO-4113

Combination no. : 0 400 876 356

Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300AOC2195  
 -1R  
 Governor no. : 0 420 233 222

Customer-spec. information  
 Customer : DAF

Engine : DNT 620

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 7.50...10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 11.60...11.70

---

Del.quantity cm<sup>3</sup>/ : 7.7...7.8  
 100 s: (7.5...8.0)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.5...6.7  
 Del.quantity cm<sup>3</sup>/ : 0.7...1.1  
 100 s: (0.4...1.3)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 700  
 Del.quantity : 77.5...78.5  
 1000 : (75.5...80.5)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 106...114

Testing:

1st rack travel in: 9.70  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
3rd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1580  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Rack travel in mm : 2.00  
Speed rpm : 600...660

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1290  
Rack travel in m: 10.70...10.80  
2nd speed rpm : 500  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1060  
Rack travel in m: 11.00...11.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 11.60...11.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 250  
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 1290  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (71.5...78.5)

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 65.5...66.5  
1000 s: (63.5...68.5)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...145.0  
1000 s: (127.0...148.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : KHD 1 g 39  
 Edition : 08.06.90  
 Replaces : 3.11.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 876 365  
 Injection pump  
 Pump designation : PES6A85D41ORS2761-1  
 EP type number : 0 410 886 894  
 Governor  
 Governor design. : RSV325...1150A8C2020  
 -1L  
 Governor no. : 0 420 232 515

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

1st version kW : 110.0  
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 12.00...12.10  
 Del. quantity cm<sup>3</sup>/ : 8.3...8.4  
 100 s : (8.1...8.6)  
 Spread cm<sup>3</sup> : 0.3  
 100 s : (0.5)  
 2nd speed rpm : 325.0  
 Rack travel in mm : 7.3...7.5  
 Del. quantity cm<sup>3</sup>/ : 0.8...1.4  
 100 s : (0.6...1.6)  
 Spread cm<sup>3</sup> : 0.2  
 100 s : (0.4)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Aneroid pressure h: 700  
 Del. quantity : 83.5...84.5  
 1000 : (81.5...86.5)  
 Spread cm<sup>3</sup> : 3.00  
 1000 : (5.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 98...106

Testing:  
 1st rack travel in: 11.00  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00  
 Speed rpm : 1220...1250

3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1405  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control Lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.9

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.50  
Speed rpm : 325  
Rack travel in mm : 7.30...7.50  
Rack travel in mm : 2.00  
Speed rpm : 420...480

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 750  
Rack travel in m: 12.90...13.00  
3rd speed rpm : 890  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.50...11.60

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
3rd pressure hPa : 700  
Rack travel in m: 12.90...13.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 89.0...91.0  
1000 s: (86.5...93.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 64.5...65.5  
1000 s: (62.5...67.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (107.0...123.0)  
Rack travel in mm : 17.00...17.40

Remark : : DX6.60

#### APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE 7,6 h15  
 Edition : 17.05.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 400 876 371

Injection pump  
 Pump designation : PES6A100D410RS2676-1  
 EP type number : 9 410 230 024  
 Governor  
 Governor design. : RSV450...1050AOC2204  
 -6L  
 Governor no. : 0 420 232 539

Customer spec. information  
 Customer : JOHN DEERE

Engine : 6466AT13

1st version kW : 120.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

K12

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 10.10...10.20

Del.quantity cm<sup>3</sup>/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Del.quantity : 101.5...103.5

1000 : (99.5...105.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 35...43

Testing:

1st rack travel in: 9.10  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
3rd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 650  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 112.0...116.0  
1000 s: (110.0...118.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 17.5...21.5  
1000 s: (15.5...23.5)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE44344  
Start-of-delivery mark at control-rod  
travel 10.5 mm and 15° after start of  
delivery.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

#### APPLICATION

Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 e 1  
 Edition : 08.08.90  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 400 876 372  
  
 Injection pump  
 Pump designation : PES6A100D410RS2764-1  
 EP type number : 0 410 806 007  
 Governor  
 Governor design. : RSV600...1100A2C2161  
 -7L  
 Governor no. : 0 420 232 540

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466AZ003

1st version kW : 164.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 190...200

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.00...13.10

Del. quantity cm<sup>3</sup>/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : 6.0...6.2

Del. quantity cm<sup>3</sup>/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del. quantity : 124.5...126.5

1000 : (122.5...128.5)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever  
position degrees: 37...45

Testing:

1st rack travel in: 12.00  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1195...1205  
3rd rack travel in: 4.00  
Speed rpm : 1215...1245  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 19...27  
Setting point w/out bumper spring  
Speed rpm : 600  
Rack travel in mm : 5.6

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 600  
Rack travel in mm : 6.00...6.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.30...9.50

Measurement

Speed 1/min : 500

1st pressure hPa : 175  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 280  
Rack travel in m: 12.10...12.50  
3rd pressure hPa : 900  
Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 68.0...72.0  
1000 s: (66.0...74.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (175.0...205.0)

LOW IDLE

Speed rpm : 600  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44661  
Start-of-delivery mark at control-rod  
travel 10.5 mm and 15° after start of  
delivery.

Starting/full-load transition speed  
from holding magnet = 450 1/min.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,7 e 2  
 Edition : 09.07.90  
 Replaces : -  
 Test oil : ISO-4113  
  
 Combination no. : 0 400 876 373  
  
 Injection pump  
 Pump designation : PES6A100D410RS2764-1  
 EP type number : 0 410 806 007  
 Governor  
 Governor design. : RSV600...1100A2C2161  
 -8L  
 Governor no. : 0 420 232 541

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466AZ004

1st version kW : 150.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
  
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 190...200

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness : 6.00X2.00X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.30...12.40

Del. quantity cm<sup>3</sup>/ : 11.6...11.8

100 s: (11.4...12.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 600.0

Rack travel in mm : 6.3...6.5

Del. quantity cm<sup>3</sup>/ : 1.9...2.3

100 s: (1.7...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del. quantity : 116.0...118.0

1000 : (114.0...120.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever  
position degrees: 41...49

Testing:

1st rack travel in: 11.30  
Speed rpm : 1155...1165  
2nd rack travel in: 4.00  
Speed rpm : 1220...1230  
3rd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 600  
Rack travel in mm : 5.9

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 600  
Rack travel in mm : 6.30...6.50

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 750  
Rack travel in m: 13.90...14.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 95  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 200  
Rack travel in m: 12.60...13.00  
3rd pressure hPa : 900  
Rack travel in m: 13.90...14.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 138.5...142.5  
1000 s: (136.5...144.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 70.5...74.5  
1000 s: (68.5...76.5)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1155...1165

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 180.0...200.0  
1000 s: (175.0...205.0)

LOW IDLE

Speed rpm : 600  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 19.0...23.0  
1000 s: (17.0...25.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE44662  
Start-of-delivery mark = 15.5° after  
start of delivery cyl. 1.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : HAN 10,8 f6  
 Edition : 17.05.90  
 Replaces : 1.9.89  
 Test oil : ISO-4113

Combination no. : 0 401 076 009

Injection pump  
 Pump designation : PE6A100D32ORS3030-1  
 EP type number : 0 411 006 019  
 Governor  
 Governor design. : RSV350...1100A8C2232  
 R  
 Governor no. : 0 420 233 218

Customer-spec. information  
 Customer : HANOMAG

Engine : D946T-70E

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.80...1.90  
 : (1.75...1.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50  
 & maximum rack tra: 21.00  
 Difference ° CS : 5.50...6.50

BASIC SETTING

1st speed rpm : 1100

---

Rack travel in mm : 9.80...9.90

---

Del.quantity cm<sup>3</sup>/ : 12.6...12.8  
 100 s: (12.4...13.0)

---

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm<sup>3</sup>/ : 1.1...1.7  
 100 s: (0.8...1.9)

Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1100  
 Aneroid pressure h: 700  
 Del.quantity : 126.0...128.0  
 1000 : (124.0...130.0)

Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

RATED SPEED

1st version  
 Control lever  
 position degrees: 95...103

Testing:

1st rack travel in: 8.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
3rd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1340  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 475...535

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 500  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 915  
Rack travel in m: 10.10...10.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 10.60...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.00  
2nd pressure hPa : 450  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 290  
Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 89.0...91.0  
1000 s: (87.0...93.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...235.0  
1000 s: (217.0...238.0)  
Rack travel in mm : 19.50...21.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 12,0 g  
 Edition : 29.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 838 705  
 Injection pump  
 Pump designation : PE8P110A12OLS3252  
 EP type number : 0 411 818 721  
 Governor  
 Governor design. : RQV250...1100PA951  
 Governor no. : 0 421 813 854

Customer-spec. information  
 Customer : STEYR

Engine : WD815.66

1st version kW : 270.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 3.7...3.9

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.30

2nd speed rpm : 450  
 travel mm : 2.80...3.40

3rd speed rpm : 700  
 travel mm : 4.50...5.10

4th speed rpm : 1145  
 travel mm : 8.40...8.60

5th speed rpm : 1230  
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version

Control lever  
position degrees: 113...121

Testing:

1st rack travel in: 12.10  
Speed rpm : 1140...1150

2nd rack travel in: 4.00  
Speed rpm : 1210...1240

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 59...67

Testing:

Speed rpm : 100  
Minimum rack travel: 5.00  
Speed rpm : 250  
Rack travel in mm : 3.70...3.90

CONSTANT REGULATION

Speed rpm : 250...390

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version

1st speed rpm : 1100  
Rack travel in m: 13.10...13.20

2nd speed rpm : 600  
Rack travel in m: 13.40...13.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20

2nd pressure hPa : 600  
Rack travel in m: 12.50...12.60

3rd pressure hPa : 380  
Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...260.0  
1000 s: (216.0...264.0)  
Rack travel in mm : 20.00...21.00

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 12,0 f  
 Edition : 29.05.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 838 707  
 Injection pump  
 Pump designation : PE8P110A120LS3252  
 EP type number : 0 411 818 721  
 Governor  
 Governor design. : RQ300/1100PA958  
 Governor no. : 0 421 801 522

Customer-spec. information  
 Customer : STEYR

Engine : WD815.66

1st version kW : 270.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 4- 8- 6- 3-  
 7- 2

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 17.4...17.6

100 s: (17.1...17.9)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 3.7...3.9

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.60...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 174.0...176.0

1000 : (171.0...179.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.10

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 3.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 5.20  
Speed rpm : 300  
Rack travel in mm : 3.70...3.90  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 600  
Rack travel in m: 13.40...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 600  
Rack travel in m: 12.50...12.60  
3rd pressure hPa : 380  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 186.0...190.0  
1000 s: (183.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 117.0...119.0  
1000 s: (114.0...122.0)

#### BREAKAWAY

K23

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...260.0  
1000 s: (216.0...264.0)  
Rack travel in mm : 20.00...21.00

Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 11,8 f 2
Edition : 08.06.90
Replaces : 7.4.89
Test oil : ISO-4113
Combination no. : 0 401 846 398
Injection pump
Pump designation : PE6P110A72ORS371-1
EP type number : 0 411 816 166
Governor
Governor design. : RQ300/1100PA424-1
Governor no. : 0 421 801 395

Customer spec. information
Customer : MERCEDES-BENZ

Engine : OM355A

1st version kW : 206.0
Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 100...120

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
(2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.70...11.80

Del. quantity cm3/ : 16.0...16.2

100 s: (15.7...16.4)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del. quantity cm3/ : 1.4...2.0

100 s: (1.1...2.2)

Spread cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del. quantity : 160.0...162.0

1000 : (157.5...164.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 650

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.70

Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Rack travel in mm : 2.00  
Speed rpm : 410...450

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 650  
Rack travel in m: 11.70...11.90

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.70...11.80

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 390  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 350  
Rack travel in m: 11.20...11.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 156.0...160.0  
1000 s: (153.0...163.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 135.0...137.0  
1000 s: (132.0...140.0)  
Spread cm3 : 6.00  
1000 s: (9.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...145.0  
1000 s: (116.0...149.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,6 x4  
 Edition : 10.08.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 472Z  
 Injection pump  
 Pump designation : PE6P110A32ORS407-1  
 EP type number : 0 411 816 147  
 Governor  
 Governor design. : RQ275/1000PA641  
 Governor no. : 0 421 801 174

Customer-spec. information  
 Customer : DAF

Engine : DKFL1160

1st version kW : 191.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 12.80...12.90  
 Del. quantity cm<sup>3</sup>/ : 15.1...15.3  
 100 s : (14.9...15.6)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

2nd speed rpm : 275.0  
 Rack travel in mm : 7.0...7.2  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.4  
 100 s : (0.6...1.6)  
 Spread cm<sup>3</sup> : 0.4  
 100 s : (0.7)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 700  
 Del. quantity : 151.5...153.5  
 1000 : (149.0...156.0)  
 Spread cm<sup>3</sup> : 4.00  
 1000 : (7.50)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 11.10  
 Speed rpm : 1045...1060  
 2nd rack travel in: 4.00  
 Speed rpm : 1110...1140  
 4th rack travel in: 1300  
 Speed rpm : 0.00...1.00

## LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275

Rack travel in mm : 7.1

### Testing:

Speed rpm : 100

Minimum rack trave: 8.60

Speed rpm : 275

Rack travel in mm : 7.00...7.20

Rack travel in mm : 2.00

Speed rpm : 350...390

## TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 13.00...13.10

2nd speed rpm : 1000

Rack travel in m: 12.10...12.30

3rd speed rpm : 790

Rack travel in m: 12.60...12.80

4th speed rpm : 865

Rack travel in m: 12.20...12.50

## Aneroid/Altitude

Compensator Test

### 1st version

Setting

Speed rpm : 600

Pressure hPa : 700

Rack travel mm : 12.80...12.90

### Measurement

Speed 1/min : 600

1st pressure hPa : -

Rack travel in m: 10.50...10.60

2nd pressure hPa : 190

Rack travel in m: 12.30...12.40

3rd pressure hPa : 130

Rack travel in m: 11.10...11.30

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 700

Speed rpm : 1000

Del.quantity cm<sup>3</sup>/ : 137.0...139.0

1000 s: (134.0...142.0)

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 102.0...104.0

1000 s: (99.5...106.5)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10

Speed rpm : 1045...1060

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 245.0...285.0

1000 s: (241.0...289.0)

Rack travel in mm : 19.50...21.00

## LOW IDLE

Speed rpm : 275

Rack travel in mm : 7.00...7.20

Del.quantity cm<sup>3</sup>/ : 9.0...14.0

1000 s: (6.5...16.5)

Spread cm<sup>3</sup> : 4.50

1000 s: (7.50)

## TESTING & SETTING

### RACK TRAVEL SENSOR

Supply voltage : 24.0

Speed rpm : 600

Pressure hPa : 700

Set quantity with control lever

cm<sup>3</sup>/ : 11.5...11.6

Voltage : 2,800...2,820

volt : (2,790...2,830)

Rack travel in mm : 6.00...6.10

Voltage volt : 1,690...1,730

volt : (1,680...1,740)

Remarks:

The stop position of the control rod must be easily reached with the stop lever

On activation of the starting solenoid, the start position must be reached.

## APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 h  
 Edition : 06.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 401 846 826

Injection pump  
 Pump designation : PE6P120A32ORS3178  
 EP type number : 0 411 826 752  
 Governor  
 Governor design. : RGV250...1025PA921-2  
 Governor no. : 0 421 813 785

Customer-spec. information  
 Customer : VOLVO

Engine : TD122FS

1st version kW : 287.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 683 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.00...14.10

Del.quantity cm<sup>3</sup>/ : 25.2...25.4

100 s: (24.9...25.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.7

Del.quantity cm<sup>3</sup>/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1090

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 252.0...254.0

1000 : (249.0...257.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever

position degrees: 61...69

Testing:

1st rack travel in: 13.00

Speed rpm : 1055...1065

2nd rack travel in: 4.00

Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 6...14

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 120  
Rack travel in m: 0.20...0.30  
3rd pressure hPa : 810  
Rack travel in m: 3.30...3.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del.quantity cm<sup>3</sup>/ : 18.0...23.0  
1000 s: (15.5...25.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

#### Remarks:

:  
Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 d8  
 Edition : 06.07.90  
 Replaces : 11.5.89  
 Test oil : ISO-4113

Combination no. : 0 401 846 874

Injection pump  
 Pump designation : PE6P120A32ORS3183  
 EP type number : 0 411 826 754  
 Governor  
 Governor design. : RQ250/1000PA832  
 Governor no. : 0 421 801 368

Customer-spec. information  
 Customer : DAF

Engine : WS 259

1st version kW : 259.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 850

---

Rack travel in mm : 12.80...12.90

---

Del.quantity cm<sup>3</sup>/ : 21.3...21.5  
 100 s: (21.0...21.8)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.6...7.0  
 Del.quantity cm<sup>3</sup>/ : 1.4...2.0  
 100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 550  
 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 1000  
 Del.quantity : 213.0...215.0  
 1000 : (210.0...218.0)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 15.8

Testing:  
 1st rack travel in: 11.80  
 Speed rpm : 1035...1050  
 2nd rack travel in: 4.00

Speed rpm : 1125...1155  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.8

Testing:

Speed rpm : 100  
Minimum rack trave: 8.30  
Speed rpm : 250  
Rack travel in mm : 6.60...7.00  
Rack travel in mm : 2.00  
Speed rpm : 350...390

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 1000  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.80...12.90

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 460  
Rack travel in m: 12.20...12.30  
3rd pressure hPa : 250  
Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1035...1050

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...300.0  
1000 s: (256.0...304.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.60...7.00  
Del.quantity cm3/ : 14.0...20.0  
1000 s: (11.0...23.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MB 14,6 p 3  
 Edition : 07.07.90  
 Replaces : 2.2.90  
 Test oil : ISO-4113

Combination no. : 0 401 878 707

Injection pump  
 Pump designation : PE8P120A320LS3816-10  
 EP type number : 0 411 828 715  
 Governor  
 Governor design. : RSV350...750POA824-3  
 Governor no. : 0 421 833 229

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM422A

1st version kW : 227.0  
 Rated speed : 1500

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

### BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.10...12.20

Del. quantity cm<sup>3</sup>/ : 18.4...18.6

100 s: (18.1...18.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.6

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

### GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.50

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 184.0...186.0

1000 : (181.0...189.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version

Control lever  
position degrees: 26...30

Testing:  
1st rack travel in: 11.10  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...793

LOW IDLE 1  
Control lever  
position degrees: 12...20  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.30...5.60

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 170.0...190.0  
1000 s: (166.0...194.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9a13  
 Edition : 15.12.89  
 Replaces : 31.7.87  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 044  
 Injection pump  
 Pump designation : PES6P120A720/3LS470-  
 2  
 EP type number : 0 412 026 050  
 Governor  
 Governor design. : RQ300/1100PA658-19  
 Governor no. : 0 421 801 323

Customer-spec. information  
 Customer : MAN

Engine : D2866LFZ

1st version kW : 243.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 20.7...20.9

100 s: (20.4...21.2)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 1000

Del.quantity : 207.0...209.0

1000 : (204.0...212.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.50

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack trave: 6.20  
Speed rpm : 300  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.70...11.80  
2nd speed rpm : 750  
Rack travel in m: 11.90...12.20  
3rd speed rpm : 875  
Rack travel in m: 11.80...12.00  
4th speed rpm : 950  
Rack travel in m: 11.20...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 85  
Rack travel in m: 9.30...9.40  
3rd pressure hPa : 280  
Rack travel in m: 10.50...10.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1100

Del.quantity cm3/ : 203.0...207.0  
1000 s: (200.0...210.0)  
Aneroid pressure h: 1000  
Speed rpm : 650  
Del.quantity cm3/ : 208.0...214.0  
1000 s: (205.0...217.0)  
Aneroid pressure h: 280  
Speed rpm : 500  
Del.quantity cm3/ : 184.0...196.0  
1000 s: (181.0...199.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 225.0...245.0  
1000 s: (221.0...249.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7756

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 11,9 u1  
 Edition : 20.07.90  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 036 740

Injection pump  
 Pump designation : PES6P120A720/3LS3255  
 EP type number : 0 412 026 741  
 Governor  
 Governor design. : RQ300/1000PA813-13  
 Governor no. : 0 421 801 529

## Customer-spec. information

Customer : MAN

Engine : D2866LF03

1st version kW : 273.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 067

Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

---

Rack travel in mm : 15.00...15.10

---

Del.quantity cm3/ : 24.2...24.4

---

100 s: (23.9...24.7)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 4.9...5.3  
 Del.quantity cm3/ : 1.7...2.3  
 100 s: (1.4...2.6)

Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2

Speed rpm : 550  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Aneroid pressure h: 1200  
 Del.quantity : 242.0...244.0  
 1000 : (239.0...247.0)

Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 550  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 13.80

Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 200  
Minimum rack trave: 6.50  
Speed rpm : 300  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 700  
Rack travel in m: 15.30...15.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90  
2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 13.70...14.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm3/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Speed rpm : 700

Del.quantity cm3/ : 89.0...99.0  
1000 s: (86.0...102.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1045...1060

#### INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 0-7050  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,9 u  
 Edition : 19.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 036 741  
 Injection pump  
 Pump designation : PES6P120A720/3LS3255  
 EP type number : 0 412 026 739  
 Governor  
 Governor design. : RQV300...1000PA876-6  
 Governor no. : 0 421 813 866

Customer-spec. information  
 Customer : MAN

Engine : D2866LF03  
 1st version kW : 273.0  
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.50...15.50  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10  
 & maximum rack tra: 14.5...15.5  
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 15.00...15.10  
 Del.quantity cm<sup>3</sup>/ : 24.2...24.4  
 100 s: (23.9...24.7)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 4.7...5.1  
 Del.quantity cm<sup>3</sup>/ : 1.7...2.3  
 100 s: (1.4...2.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1045  
 travel mm : 9.90...10.10  
 2nd speed rpm : 300  
 travel mm : 1.50...1.70  
 3rd speed rpm : 500  
 travel mm : 3.30...3.90  
 4th speed rpm : 800  
 travel mm : 6.80...7.20  
 5th speed rpm : 1300  
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1060  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700  
Aneroid pressure h: 1200  
Del.quantity : 242.0...244.0  
1000 : (239.0...247.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 298...306

Testing:

1st rack travel in: 13.60  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1125...1155  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 256...264

Testing:

Speed rpm : 200  
Minimum rack travel: 6.40  
Speed rpm : 300  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 290...400

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 700  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.70

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.00...15.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.70...11.90

2nd pressure hPa : 110  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 470  
Rack travel in m: 14.00...14.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 236.0...242.0  
1000 s: (233.0...245.0)  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 95.0...101.0  
1000 s: (92.0...104.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.60  
Speed rpm : 1040...1050

INTERMEDIATE RATED SPEED

Rack travel in mm : 4.00

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.70...5.10  
Del.quantity cm<sup>3</sup>/ : 17.0...23.0  
1000 s: (14.0...26.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MAN-NR. 0-7051

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 6  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q29  
 Edition : 07.08.90  
 Replaces : 10.85  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 204  
 Injection pump  
 Pump designation : PES6P120A720LS388  
 EP type number : 0 412 026 030  
 Governor  
 Governor design. : RQV250...1100PA504

Customer-spec. information  
 Customer : MAN

Engine : D2566MKF

1st version kw : 206.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 019  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm<sup>3</sup>/ : 17.8...18.0  
 100 s: (17.5...18.3)  
 Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm<sup>3</sup>/ : 1.2...1.8  
 100 s: (0.9...2.1)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.80...2.10  
 2nd speed rpm : 800  
 travel mm : 5.30...5.60  
 3rd speed rpm : 1100  
 travel mm : 7.80...8.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Aneroid pressure h: 700  
 Del.quantity : 178.0...180.0  
 1000 : (175.0...183.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

#### Testing:

1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 8...16

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.80  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

### CONSTANT REGULATION

Speed rpm : 365...480

### TORQUE CONTROL

Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 1100  
Rack travel in m: 10.20...10.30  
3rd speed rpm : 900  
Rack travel in m: 11.00...11.20  
4th speed rpm : 1000  
Rack travel in m: 10.30...10.60

### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 310  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 430  
Rack travel in m: 10.90...11.10

### START CUT-OUT

Speed 1/min : 170 (190)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 1100  
Del. quantity cm<sup>3</sup>/ : 160.0...166.0  
1000 s: (157.0...169.0)  
Aneroid pressure h: 700  
Speed rpm : 650  
Del. quantity cm<sup>3</sup>/ : 171.0...177.0  
1000 s: (168.0...180.0)  
Aneroid pressure h: 310  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 131.0...137.0  
1000 s: (128.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 104.0...106.0  
1000 s: (101.0...109.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 9.20  
Speed rpm : 1140...1150

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (201.0...229.0)

### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del. quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7113

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q33  
 Edition : 07.06.90  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 205  
 Injection pump  
 Pump designation : PES6P120A720LS388  
 EP type number : 0 412 026 030  
 Governor  
 Governor design. : RQV250...1100PA504

Customer-spec. information  
 Customer : MAN

Engine : D2566MKF

1st version kW : 206.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750  


---

 Rack travel in mm : 11.40...11.50  


---

 Del.quantity cm3/ : 17.8...18.0  
 100 s: (17.5...18.3)  


---

 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm3/ : 1.2...1.8  
 100 s: (0.9...2.1)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.80...2.10  
 2nd speed rpm : 800  
 travel mm : 5.30...5.60  
 3rd speed rpm : 1100  
 travel mm : 7.80...8.00

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Aneroid pressure h: 700  
 Del.quantity : 178.0...180.0  
 1000 : (175.0...183.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 62...70

### Testing:

1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1210...1240  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 8...16

### Testing:

Speed rpm : 100  
Minimum rack travel: 7.80  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40

## CONSTANT REGULATION

Speed rpm : 365...480

## TORQUE CONTROL

Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 1100  
Rack travel in m: 10.20...10.30  
3rd speed rpm : 900  
Rack travel in m: 11.00...11.20  
4th speed rpm : 1000  
Rack travel in m: 10.30...10.60

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.40...11.50

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 310  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 430  
Rack travel in m: 10.90...11.10

## START CUT-OUT

Speed 1/min : 170 (190)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 700  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 160.0...166.0  
1000 s: (157.0...169.0)  
Aneroid pressure h: 700  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 171.0...177.0  
1000 s: (168.0...180.0)  
Aneroid pressure h: 310  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...137.0  
1000 s: (128.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 104.0...106.0  
1000 s: (101.0...109.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 205.0...225.0  
1000 s: (201.0...229.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

### Remarks:

: MAN-NR. 2-7111

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 11,1q32  
 Edition : 02.01.90  
 Replaces : 11.1.88  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 209  
 Injection pump  
 Pump designation : PES6P120A720LS388  
 EP type number : 0 412 026 030  
 Governor  
 Governor design. : RQ250/1100PA509  
 Governor no. : 0 421 801 117

Customer-spec. information  
 Customer : MAN

Engine : D2566MK

1st version kW : 206.0  
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder assembly : 1 688 901 019  
 Opening pressure, bar : 207...210  
 Orifice plate diameter mm : 0,8  
 Test lines : 1 680 750 067  
 Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 750  
 Rack travel in mm : 11.40...11.50  
 Del.quantity cm3/ : 17.8...18.0  
 100 s: (17.5...18.3)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 250.0  
 Rack travel in mm : 6.2...6.4  
 Del.quantity cm3/ : 1.2...1.8  
 100 s: (0.9...2.1)  
 Spread cm3 : 0.8  
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Aneroid pressure h: 700  
 Del.quantity : 178.0...180.0  
 1000 : (175.0...183.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 9.20

Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 7.80  
Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 335...375

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 1100  
Rack travel in m: 10.20...10.30  
3rd speed rpm : 875  
Rack travel in m: 11.10...11.30  
4th speed rpm : 985  
Rack travel in m: 10.40...10.70

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.40...11.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.20...9.30  
2nd pressure hPa : 310  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 430  
Rack travel in m: 10.90...11.10

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 1100  
Del.quantity cm3/ : 160.0...166.0  
1000 s: (157.0...169.0)  
Aneroid pressure h: 700  
Speed rpm : 650  
Del.quantity cm3/ : 171.0...177.0  
1000 s: (168.0...180.0)  
Aneroid pressure h: 310  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...137.0  
1000 s: (128.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 104.0...106.0  
1000 s: (101.0...109.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.20...6.40  
Del.quantity cm3/ : 12.0...18.0  
1000 s: (9.0...21.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

: MAN-NR. 2-7066

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 a  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 810

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848K  
 Governor no. : 0 421 815 168

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del. quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 53...61

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 5.60  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

## FUEL DELIVERY CHARACTERISTICS

L19

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm3/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P10

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 a1  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 814

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-1K  
 Governor no. : 0 421 815 169

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kw : 224.0  
 Rated speed : 1700

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475  
Rack travel in m: 12.60...13.00

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P6

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a2  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 815

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-2K  
 Governor no. : 0 421 815 170

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 275 4VH

1st version kW : 202.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del. quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del. quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360  
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P2

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1 a3  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 816  
  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-3K  
 Governor no. : 0 421 815 171

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-250L 4VH

1st version kw : 186.0  
 Rated speed : 1750

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del. quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del. quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.10...9.50  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 146.0...150.0  
1000 s: (144.0...152.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 925...935

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 165.0...205.0  
1000 s: (155.0...215.0)  
Rack travel in mm : 9.10...9.50

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P18

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 a4  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 817

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA848-4K  
 Governor no. : 0 421 815 173

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EC6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 900

Rack travel in mm : 15.20...15.30

Del.quantity cm<sup>3</sup>/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 3.10...3.30

3rd speed rpm : 850  
 travel mm : 5.90...6.10

4th speed rpm : 1000  
 travel mm : 7.50...7.70

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 250.5...252.5

1000 : (247.5...255.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.20  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.20...15.30  
2nd speed rpm : 625  
Rack travel in m: 15.50...15.60  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...15.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 280  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 650  
Rack travel in m: 13.60...14.00

## FUEL DELIVERY CHARACTERISTICS

L28

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 278.0...284.0  
1000 s: (275.0...287.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (149.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.20  
Speed rpm : 950...960

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
1000 s: (110.0...170.0)  
Rack travel in mm : 8.60...9.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P14

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a5
Edition : 04.09.90
Replaces : 02.05.90
Test oil : ISO-4113
Combination no. : 0 402 746 818
Injection pump
Pump designation : PES6P120A720RS7135
EP type number : 0 412 726 807
Governor
Governor design. : RQV325...875PA848-5K
Governor no. : 0 421 815 174

Customer-spec. information
Customer : MACK TRUCKS INC.

Engine : EM 6 275L 4VH

1st version kw : 202.0
Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow
quantity min. 1/h: 160...170

Test nozzle holder
assembly : 1 688 901 101

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00X2.00X600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
: (2.70...2.90)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485  
Rack travel in m: 12.70...13.30

## FUEL DELIVERY CHARACTERISTICS

MO2

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (143.0...151.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 925...935

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P22

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

**Note remarks**

Test sheet : MAC 11,1 a6  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 819

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-6K  
 Governor no. : 0 421 815 175

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM6-225L 4VH

1st version kw : 165.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 10.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

---

Rack travel in mm : 11.00...11.10

---

Del.quantity cm<sup>3</sup>/ : 15.8...16.0  
 100 s: (15.5...16.3)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)

Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 700  
Rack travel in m: 11.80...12.00  
4th speed rpm : 600  
Rack travel in m: 12.50...12.70  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

MO4

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 131.0...135.0  
1000 s: (129.0...137.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 925...935

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P26

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b5  
 Edition : 04.09.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 820

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878K  
 Governor no. : 0 421 815 177

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 275 4VH

1st version kW : 202.0  
 Rated speed : 1700

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 18.1...18.3

100 s: (17.8...18.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 181.0...183.0

1000 : (178.0...186.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control Lever  
position degrees: 52...60

Testing:

1st rack travel in: 11.00  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.70  
3rd speed rpm : 700  
Rack travel in m: 12.50...12.70  
4th speed rpm : 500  
Rack travel in m: 0.00...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 360  
Rack travel in m: 11.50...11.90

FUEL DELIVERY CHARACTERISTICS

M07

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 210.5...216.5  
1000 s: (207.5...219.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (142.0...150.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.00  
Speed rpm : 900...910

INTERMEDIATE RATED SPEED

Rack travel in mm : 11.30  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.50...9.90

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P4

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of  
~~start-of-delivery~~ sensor on cyl. 1  
start of delivery





**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 b  
 Edition : 04.09.90  
 Replaces : 2.5.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 821

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-1K  
 Governor no. : 0 421 815 178

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 300 4VH

1st version kW : 224.0  
 Rated speed : 1700

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 200.5...202.5

1000 : (197.5...205.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 600  
Rack travel in m: 13.50...13.70  
4th speed rpm : 500  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.50...13.70

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 250  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 475  
Rack travel in m: 12.60...13.00

## FUEL DELIVERY CHARACTERISTICS

M10

1st version  
Aneroid pressure h: 900  
Speed rpm : 700  
Del.quantity cm3/ : 217.0...223.0  
1000 s: (214.0...226.0)  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

INTERMEDIATE RATED SPEED  
Rack travel in mm : 12.00  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300.0

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 9.90...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P8

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test

bench: setting for test equipment,  
check value for engine equipment.  
Delivery-valve spring pre-tension  
3.0...3.2 mm.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1 b1  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 822  
  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-2K  
 Governor no. : 0 421 815 179

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.90...14.00

Del. quantity cm<sup>3</sup>/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.0...4.2

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 3.10...3.30

3rd speed rpm : 850  
travel mm : 5.90...6.10

4th speed rpm : 1000  
travel mm : 7.50...7.70

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del. quantity : 236.5...238.5

1000 : (233.5...241.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 12.90  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.60  
Speed rpm : 325  
Rack travel in mm : 4.00...4.20

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.90...14.00  
2nd speed rpm : 625  
Rack travel in m: 14.10...14.20  
3rd speed rpm : 800  
Rack travel in m: 14.00...14.10  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 275  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

FUEL DELIVERY CHARACTERISTICS

M13

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 257.0...263.0  
1000 s: (254.0...266.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 136.0...140.0  
1000 s: (134.0...142.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.90  
Speed rpm : 950...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 13.00  
Speed rpm : 805  
Rack travel in mm : 4.10  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...180.0  
1000 s: (130.0...190.0)  
Rack travel in mm : 8.30...8.70

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.00...4.20  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P12

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b2  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 823

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-3K  
 Governor no. : 0 421 815 180

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 275L 4VH

1st version kW : 202.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 19.0...19.2

100 s: (18.7...19.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 3.7...4.3

100 s: (3.5...4.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 190.0...192.0

1000 : (187.0...195.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 11.20  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1030...1060  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack trave: 6.20  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 510  
Rack travel in m: 14.10...14.30  
3rd speed rpm : 700  
Rack travel in m: 13.20...13.40  
4th speed rpm : 400  
Rack travel in m: 0.00...13.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.10...14.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 280  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 485  
Rack travel in m: 12.70...13.30

FUEL DELIVERY CHARACTERISTICS

M16

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm3/ : 262.5...268.5  
1000 s: (259.5...271.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (143.0...151.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 925...935

INTERMEDIATE RATED SPEED  
Rack travel in mm : 10.30  
Speed rpm : 805.0  
Rack travel in mm : 4.70  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.40...9.60

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm3/ : 37.0...43.0  
1000 s: (35.0...45.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P24

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Delivery-valve spring pre-tension 3.0...3.2 mm.



Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note remarks

Test sheet : MAC 11,1 b3  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 824

Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-4K  
 Governor no. : 0 421 815 181

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 225L 4VH

1st version kW : 165.0  
 Rated speed : 1750

**TEST BENCH REQUIREMENTS**

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

**BEGINNING OF DELIVERY**

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

**BASIC SETTING**

1st speed rpm : 875

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 15.8...16.0  
 100 s: (15.5...16.3)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.6...4.8  
 Del.quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

**GUIDE SLEEVE TRAVEL**

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 2.80...3.10  
 3rd speed rpm : 850  
 travel mm : 6.20...6.40  
 4th speed rpm : 1000  
 travel mm : 7.70...7.90

**FULL LOAD DELIV. AT FULL LOAD STOP**

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 158.5...160.5  
 1000 : (155.5...163.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 10.00  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.00...11.10  
2nd speed rpm : 510  
Rack travel in m: 13.20...13.40  
3rd speed rpm : 600  
Rack travel in m: 12.50...12.70  
4th speed rpm : 700  
Rack travel in m: 11.80...12.00  
5th speed rpm : 350  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 13.20...13.40

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 220  
Rack travel in m: 9.70...9.80  
3rd pressure hPa : 500  
Rack travel in m: 12.00...12.40

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 234.0...240.0  
1000 s: (231.0...243.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 131.0...135.0  
1000 s: (129.0...137.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 925...935

INTERMEDIATE RATED SPEED  
Rack travel in mm : 10.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.50...8.90

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P28

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench; setting for test equipment, check value for engine equipment.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b6  
 Edition : 04.05.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 825

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-5K  
 Governor no. : 0 421 815 182

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E C 6 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 15.00...15.10

---

Del. quantity cm<sup>3</sup>/ : 25.0...25.2  
 100 s: (24.7...25.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del. quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1130  
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900

Aneroid pressure h: 1200  
Del. quantity : 250.5...252.5  
1000 : (247.5...255.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.60  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 625  
Rack travel in m: 15.40...15.50  
3rd speed rpm : 700  
Rack travel in m: 15.30...15.40  
4th speed rpm : 500  
Rack travel in m: 0.00...15.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.40...15.50

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70

M22

2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 650  
Rack travel in m: 13.30...13.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del. quantity cm<sup>3</sup>/ : 272.5...278.5  
1000 s: (269.5...281.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del. quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del. quantity cm<sup>3</sup>/ : 130.5...134.5  
1000 s: (128.5...136.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 950...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 13.70  
Speed rpm : 850  
Rack travel in mm : 5.00  
Speed rpm : 350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (120.0...180.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del. quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P16

Delivery-valve spring pre-tension

3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 b4  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 826  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA878-6K  
 Governor no. : 0 421 815 183

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 250L 4VH

1st version kw : 186.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 16.3...16.5

100 s: (16.0...16.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.20

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 163.0...165.0

1000 : (160.0...168.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)



## RATED SPEED

1st version  
Control lever  
position degrees: 52...60

Testing:  
1st rack travel in: 9.80  
Speed rpm : 925...935  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 510  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.80  
4th speed rpm : 550  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

## FUEL DELIVERY CHARACTERISTICS

M25

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 240.0...246.0  
1000 s: (237.0...249.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 925...935

INTERMEDIATE RATED SPEED  
Rack travel in mm : 10.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 145.0...185.0  
1000 s: (135.0...195.0)  
Rack travel in mm : 8.60...9.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173-P20

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,

check value for engine equipment.  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 d  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 828

Injection pump  
 Pump designation : PES6P120A72ORS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA878-7K  
 Governor no. : 0 421 815 184

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : EM6 300L 4VH

1st version kW : 224.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 6.00...8.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 11.10...11.20

---

Del.quantity cm<sup>3</sup>/ : 19.9...20.1  
 100 s: (19.6...20.4)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 600  
 travel mm : 4.10...4.30

4th speed rpm : 875  
 travel mm : 7.30...7.50

5th speed rpm : 1000  
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1500  
 Del.quantity : 199.0...201.0  
 1000 : (196.0...204.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 10.10  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 510  
Rack travel in m: 16.50...16.70  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50  
4th speed rpm : 600  
Rack travel in m: 15.50...15.70  
5th speed rpm : 450  
Rack travel in m: 0.00...16.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1500  
Rack travel mm : 16.50...16.70

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 370

Rack travel in m: 10.70...10.80  
3rd pressure hPa : 710  
Rack travel in m: 14.40...14.80

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 299.0...305.0  
1000 s: (296.0...308.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0  
1000 s: (168.0...193.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 152.5...156.5  
1000 s: (150.5...158.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 915...925

INTERMEDIATE RATED SPEED  
Rack travel in mm : 11.30  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (135.0...165.0)  
Rack travel in mm : 8.30...8.70

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5174-P4  
Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 a7  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 829

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...1050PA848-8  
 K  
 Governor no. : 0 421 815 185

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6-270 4VH

1st version kW : 201.0  
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050  


---

 Rack travel in mm : 12.20...12.30  


---

 Del.quantity cm<sup>3</sup>/ : 17.4...17.6  


---

 100 s: (17.1...17.9)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 3.8...4.4  
 100 s: (3.6...4.6)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL  
 1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 2.50...2.80  
 3rd speed rpm : 800  
 travel mm : 4.80...5.00  
 4th speed rpm : 1050  
 travel mm : 7.30...7.60  
 5th speed rpm : 1200  
 travel mm : 9.40...9.60

GUIDE SLEEVE POSITION  
 Control-lever position  
 Degree: -1  
 Speed rpm : 1210  
 Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 900  
Del.quantity : 174.0...176.0  
1000 : (171.0...179.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 55...63

Testing:  
1st rack travel in: 11.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.40  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...600

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 630  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 925  
Rack travel in m: 11.90...12.10  
4th speed rpm : 800  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 630  
Pressure hPa : 900  
Rack travel mm : 12.00...12.10

Measurement  
Speed 1/min : 630

N03

1st pressure hPa : -  
Rack travel in m: 8.60...9.00  
2nd pressure hPa : 270  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 400  
Rack travel in m: 11.00...11.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 630  
Del.quantity cm<sup>3</sup>/ : 192.0...198.0  
1000 s: (189.0...201.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0  
1000 s: (140.5...161.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 129.0...133.0  
1000 s: (127.0...135.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (125.0...185.0)  
Rack travel in mm : 8.60...9.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 38.0...44.0  
1000 s: (36.0...46.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5173P30

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only

to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery





BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 836

Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-12  
 K

Governer no. : 0 421 815 192

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E7 400 4VH

1st version kw : 298.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

N05

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900  


---

 Rack travel in mm : 15.50...15.60  


---

 Del.quantity cm3/ : 27.2...27.4  
 100 s : (26.9...27.7)  


---

 Spread cm3 : 0.5  
 100 s : (0.9)  


---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm3/ : 4.3...4.9  
 100 s : (4.1...5.1)  
 Spread cm3 : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 272.0...274.0  
 1000 : (269.0...277.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 14.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.50...15.60  
2nd speed rpm : 625  
Rack travel in m: 15.30...15.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...14.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.50...15.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 225  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 770  
Rack travel in m: 13.80...14.20

START CUT-OUT

Speed 1/min : 280 (290)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 309.0...315.0  
1000 s: (306.0...318.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 166.0...170.0  
1000 s: (164.0...172.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 9.90...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 43.0...49.0  
1000 s: (41.0...51.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P18

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a1  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 837

Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA848-15  
 K  
 Governor no. : 0 421 815 193

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E7 350 4VH

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

NO7

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

---

Rack travel in mm : 14.00...14.10

---

Del.quantity cm<sup>3</sup>/ : 22.8...23.0  
 100 s: (22.5...23.3)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm<sup>3</sup>/ : 4.1...4.7  
 100 s: (3.9...4.9)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 900  
 Del.quantity : 228.0...230.0  
 1000 : (225.0...233.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.00  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.90  
Speed rpm : 325  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 325...500

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 500  
Rack travel in m: 0.00...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 900  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.80...9.20  
2nd pressure hPa : 225  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 545  
Rack travel in m: 12.70...13.10

START CUT-OUT

Speed 1/min : 265 (275)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 260.0...266.0  
1000 s: (257.0...269.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 950...960

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.40...10.80

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5179-P2

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a7  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 838

Injection pump  
 Pump designation : PES6P120A72ORS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...875PA848-14

Governer no. : 0 421 815 194

Customer-spec. information  
 Customer : MACK

Engine : EM7-250L 4VH

1st version kW : 187.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

ND9

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875  


---

 Rack travel in mm : 10.40...10.50  


---

 Del.quantity cm<sup>3</sup>/ : 17.4...17.6  
 100 s : (17.1...17.9)  


---

 Spread cm<sup>3</sup> : 0.5  
 100 s : (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
 100 s : (3.8...4.8)  
 Spread cm<sup>3</sup> : 0.8  
 100 s : (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.30...1.60  
 2nd speed rpm : 500  
 travel mm : 3.40...4.00  
 3rd speed rpm : 900  
 travel mm : 6.70...6.90  
 4th speed rpm : 1075  
 travel mm : 8.40...8.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 900  
 Del.quantity : 174.0...176.0  
 1000 : (171.0...179.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 9.40  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1020...1050  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 510  
Rack travel in m: 11.90...12.10  
3rd speed rpm : 450  
Rack travel in m: 0.00...11.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 900  
Rack travel mm : 11.90...12.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 235  
Rack travel in m: 8.80...8.90  
3rd pressure hPa : 485  
Rack travel in m: 10.80...11.20

START CUT-OUT

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 244.0...250.0  
1000 s: (241.0...253.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 151.0...155.0  
1000 s: (149.0...157.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.40  
Speed rpm : 915...925

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 10.10...10.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5179-P26

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.  
Bow dimension:  
Sliding-sleeve position = 37.0 mm  
Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 b  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 839

Injection pump  
 Pump designation : PES6P120A72ORS7148  
 EP type number : 0 412 726 810  
 Governor  
 Governor design. : RQV325...875PA848-19  
 K  
 Governor no. : 0 421 815 199

Customer-spec. information  
 Customer : MACK

Engine : EM7 300L 4VH

1st version kW : 224.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)

Rack travel in mm : 6.00...8.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 11.50...11.60

---

Del.quantity cm<sup>3</sup>/ : 21.0...21.2  
 100 s: (20.7...21.5)

---

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 325.0  
 Rack travel in mm : 4.5...4.7  
 Del.quantity cm<sup>3</sup>/ : 4.1...4.7  
 100 s: (3.9...4.9)

---

Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.50...2.80

3rd speed rpm : 600  
 travel mm : 4.10...4.30

4th speed rpm : 875  
 travel mm : 7.30...7.50

5th speed rpm : 1000  
 travel mm : 8.70...9.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 210.0...212.0  
 1000 : (207.0...215.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 57...65

Testing:  
1st rack travel in: 10.50  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1000...1030  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 510  
Rack travel in m: 16.00...16.20  
3rd speed rpm : 800  
Rack travel in m: 12.00...12.20  
4th speed rpm : 600  
Rack travel in m: 15.10...15.30  
5th speed rpm : 450  
Rack travel in m: 0.00...15.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.00...16.20

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 325

Rack travel in m: 10.60...10.70  
3rd pressure hPa : 815  
Rack travel in m: 14.30...14.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 294.0...300.0  
1000 s: (291.0...303.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (166.0...191.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 166.0...170.0  
1000 s: (164.0...172.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 915...925

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 165.0...185.0  
1000 s: (155.0...195.0)  
Rack travel in mm : 8.70...9.10

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 41.0...47.0  
1000 s: (39.0...49.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MACK # 313GC5179-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a12  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 840  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...875PA848-18  
 K  
 Governor no. : 0 421 815 198

Customer-spec. information  
 Customer : MACK

Engine : EMC6 250L 4VH

1st version kW : 187.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 11.20...11.30

Del.quantity cm<sup>3</sup>/ : 17.3...17.5

100 s: (17.0...17.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del.quantity cm<sup>3</sup>/ : 3.9...4.5

100 s: (3.7...4.7)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40

2nd speed rpm : 450  
travel mm : 2.80...3.20

3rd speed rpm : 850  
travel mm : 6.20...6.40

4th speed rpm : 1000  
travel mm : 7.70...7.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875

Aneroid pressure h: 1200

Del.quantity : 173.0...175.0

1000 : (170.0...178.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

### RATED SPEED

1st version  
Control lever  
position degrees: 54...32

Testing:  
1st rack travel in: 10.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 9...17

Testing:  
Speed rpm : 275  
Minimum rack travel: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 510  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 700  
Rack travel in m: 12.00...12.20  
4th speed rpm : 450  
Rack travel in m: 0.00...13.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.10...13.30

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 9.10...9.50  
2nd pressure hPa : 215  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 435  
Rack travel in m: 12.20...12.60

### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 239.0...245.0  
1000 s: (236.0...248.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 146.0...150.0  
1000 s: (144.0...152.0)

### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.20  
Speed rpm : 915...925

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 9.10...9.50

### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5173-P32

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1 e  
 Edition : 04.05.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 842

Injection pump  
 Pump designation : PES6P120A720RS7164  
 EP type number : 0 412 726 816  
 Governor  
 Governor design. : RQV325...875PA848-17  
 K

Governer no. : 0 421 815 200

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EMC6 300L 4VH

1st version kw : 200.0  
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

N17

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 12.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875  


---

 Rack travel in mm : 14.90...15.00  


---

 Del.quantity cm<sup>3</sup>/ : 22.5...22.7  
 100 s: (22.3...22.9)  


---

 Spread cm<sup>3</sup> : 0.5  


---

 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.7...4.9  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.00...3.40  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.40...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 875  
 Aneroid pressure h: 1200  
 Del.quantity : 225.0...227.0  
 1000 : (223.0...229.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 54...62

Testing:  
1st rack travel in: 13.90  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1160  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 14.90...15.00  
2nd speed rpm : 510  
Rack travel in m: 16.90...17.10  
3rd speed rpm : 700  
Rack travel in m: 15.70...15.90  
4th speed rpm : 600  
Rack travel in m: 16.60...16.80  
5th speed rpm : 420  
Rack travel in m: 0.00...16.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 16.90...17.10

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 10.90...11.30  
2nd pressure hPa : 375  
Rack travel in m: 12.70...12.80  
3rd pressure hPa : 735  
Rack travel in m: 15.70...16.10

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 307.0...313.0  
1000 s: (304.0...316.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 179.0...181.0 \*  
1000 s: (151.0...175.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 156.0...160.0  
1000 s: (154.0...162.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.90  
Speed rpm : 915...925

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.90...11.30

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5181P14

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:  
Sliding-sleeve position = 37.0 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,1a15  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 846  
 Injection pump  
 Pump designation : PES6P120A72ORS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA848-23  
 K  
 Governor no. : 0 421 815 204

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kw : 224.0  
 Rated speed : 1700

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del. quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40

2nd speed rpm : 450  
 travel mm : 2.80...3.10

3rd speed rpm : 850  
 travel mm : 6.20...6.40

4th speed rpm : 1000  
 travel mm : 7.70...7.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 850  
 Aneroid pressure h: 900  
 Del. quantity : 200.0...202.0  
 1000 : (197.0...205.0)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 50...58

Testing:  
1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack trave: 1.50  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 0.00...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475  
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm3/ : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 900...910

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm3/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks: : MACK # 313GC5184-P6

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment. Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery



## BOSCH INJ. PUMP TEST SPECIFICATIONS

### Note remarks

Test sheet : MAC 11,1a16  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113  
  
 Combination no. : 0 402 746 847  
  
 Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...850PA878-8K  
 Governor no. : 0 421 815 205

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E6 300 4VH

1st version kW : 224.0  
 Rated speed : 1700

### TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

### BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 12.90...13.00

Del. quantity cm<sup>3</sup>/ : 20.0...20.2

100 s: (19.7...20.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.5...4.7

Del. quantity cm<sup>3</sup>/ : 3.2...3.8

100 s: (3.0...4.0)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

### GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.10

3rd speed rpm : 850

travel mm : 6.20...6.40

4th speed rpm : 1000

travel mm : 7.70...7.90

### FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del. quantity : 200.0...202.0

1000 : (197.0...205.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 50...58

Testing:

1st rack travel in: 11.90  
Speed rpm : 900...910  
2nd rack travel in: 4.00  
Speed rpm : 1025...1055  
4th rack travel in: 1100  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 7...15

Testing:

Speed rpm : 275  
Minimum rack travel: 6.10  
Speed rpm : 325  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.70  
3rd speed rpm : 600  
Rack travel in m: 13.80...13.90  
4th speed rpm : 500  
Rack travel in m: 0.00...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 250  
Rack travel in m: 11.20...11.30  
3rd pressure hPa : 475  
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

N23

1st version

Aneroid pressure h: 900  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 237.0...243.0  
1000 s: (234.0...246.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 154.0...158.0  
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 900...910

INTERMEDIATE RATED SPEED

Rack travel in mm : 12.20  
Speed rpm : 805  
Rack travel in mm : 4.60  
Speed rpm : 300

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 195.0...235.0  
1000 s: (185.0...245.0)  
Rack travel in mm : 10.30...10.50

LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.50...4.70  
Del.quantity cm<sup>3</sup>/ : 32.0...38.0  
1000 s: (30.0...40.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P8

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,

check value for engine equipment.  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 11,1a17  
 Edition : 04.09.90  
 Replaces : 02.05.90  
 Test oil : ISO-4113

Combination no. : 0 402 746 848

Injection pump  
 Pump designation : PES6P120A720RS7135  
 EP type number : 0 412 726 807  
 Governor  
 Governor design. : RQV325...900PA878-9K  
 Governor no. : 0 421 815 206

Customer-spec. information  
 Customer : MACK TRUCKS INC.

Engine : E6-350

1st version kW : 261.0  
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.80...14.90

Del.quantity cm<sup>3</sup>/ : 24.8...25.0  
 100 s: (24.5...25.3)

Spread cm<sup>3</sup> : 0.5  
 100 s: (0.9)

2nd speed rpm : 325.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm<sup>3</sup>/ : 3.9...4.5  
 100 s: (3.7...4.7)  
 Spread cm<sup>3</sup> : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.20...1.40  
 2nd speed rpm : 450  
 travel mm : 3.10...3.30  
 3rd speed rpm : 850  
 travel mm : 5.90...6.10  
 4th speed rpm : 1000  
 travel mm : 7.50...7.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 900  
 Aneroid pressure h: 1200  
 Del.quantity : 248.5...250.5  
 1000 : (245.5...253.5)  
 Spread cm<sup>3</sup> : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 56...64

Testing:  
1st rack travel in: 13.80  
Speed rpm : 950...960  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.60  
Speed rpm : 325  
Rack travel in mm : 4.90...5.10

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.30  
3rd speed rpm : 700  
Rack travel in m: 15.00...15.10  
4th speed rpm : 500  
Rack travel in m: 0.00...14.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 625  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.30

Measurement  
Speed 1/min : 625

1st pressure hPa : -  
Rack travel in m: 8.30...8.70  
2nd pressure hPa : 310  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 710  
Rack travel in m: 13.70...14.10

## FUEL DELIVERY CHARACTERISTICS

N26

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 271.0...277.0  
1000 s: (268.0...280.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (141.5...162.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 130.5...134.5  
1000 s: (128.5...136.5)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 13.80  
Speed rpm : 950...960

INTERMEDIATE RATED SPEED  
Rack travel in mm : 14.00  
Speed rpm : 850  
Rack travel in mm : 5.00  
Speed rpm : 300

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (120.0...180.0)  
Rack travel in mm : 8.30...8.70

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.90...5.10  
Del.quantity cm3/ : 39.0...45.0  
1000 s: (37.0...47.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5184-P12

Delivery-valve spring pre-tension  
3.0...3.2 mm.

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,

check value for engine equipment.  
Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

